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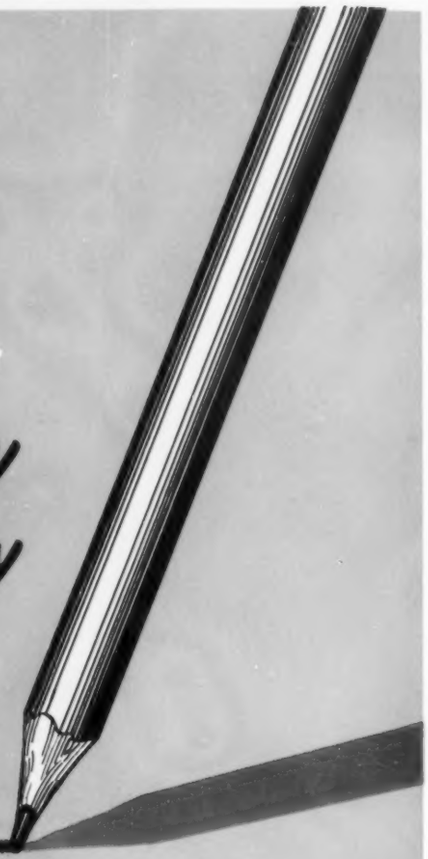

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. . . a quiz for refinery men who want to keep posted

QUESTION 1. In these countries in the sterling area—England, Scotland, Ireland and India—how many new oil refineries have been built since the close of World War II?

a _____ 4

b _____ 6

c _____ 8

d _____ 12

QUESTION 2. How many of these refineries have been designed, engineered and constructed by Lummus?

a _____ 3

b _____ 5

c _____ 7

d _____ 9

ANSWERS: 1. *The answer is (d)—12 new refineries since the war, according to* World Petroleum *magazine.*

2. *Here (b) is correct. Lummus has built 5, or 42%, of the new refineries in these countries since World War II, through the Lummus Company Ltd. of London. These five refineries are for Vacuum Oil Company Limited at Corylon, England; California Texas Oil Corporation at Visakhapatnam, India; Burmah-Shell Refineries, Ltd. at Bombay, India; Standard-Vacuum Oil Company, Ltd. at Bombay, India; and the Irish Refining Company, Ltd. at Whitegate, Ireland. Lummus Ltd. maintains a staff of over 400 specialists, and has engineered and constructed hundreds of process plants of all types and sizes in the sterling area from India to Ireland. Lummus Ltd. is one of seven international members of the Lummus group of companies which circles the globe. See Lummus on your next project.*

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World Petroleum

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Washington PIPE LINE

by Joseph B. Huttlinger

States Lose Offshore Rights

In a massive set of divided opinions, the U. S. Supreme Court has awarded title to underwater lands extending 10½ miles out into the Gulf of Mexico to Texas and Florida but rejected claims of Louisiana, Mississippi and Alabama. The latter three States have title only to lands extending three miles out into the Gulf, under the court's decision.

Unless Congress reverses the decision—which it may—the Federal government will control leasing policy between the three and 10½ miles off the shores of Louisiana, Mississippi and will collect revenues from these leases, as well as over a quarter of a billion dollars Louisiana has collected so far from oil leases outside the three-mile area.

All leases now held between the three mile limit and the 10½ boundary were approved by the Federal government, as well as by the State, under the 1953 Submerged Lands Act, so there is no threat of cancellation of leases at this time. Few of the oil companies are concerned. As one puts it "we might as well pay to the Federal government as to the State concerned" but it makes a tremendous difference to Louisiana. From the oil companies standpoint, it clears up a long-standing uncertainty, especially as to who is to finally receive royalties on offshore production.

U.S. Seeks Tariff Cuts

The U.S., which curbs imports of crude oil and of oil products, is about to seek lower duties from others on her own exports of petroleum products, natural gas and oil field equipment. This was disclosed as the State Department published two lists each containing hundreds of commodities. One list contains items on which the U.S. is ready to consider cutting tariff on imports. The second contains items on which the U.S. will seek tariff concessions from others.

The lists were published in connection with world-wide tariff cut talks set to start in September. Advance notice is given to give U.S. industries a chance to protest or to ask other items added to the list on which we will seek concessions from others.

The list of items on which we shall seek concessions from others includes aviation gasoline; diesel fuel oil; lubricating oils for transformers, automobile engines, aviation engines, and white mineral oil, paraffin oil and industrial lube oils as well as axle grease. Also, petroleum jelly and wax, paraffin wax, asphalt cement, bitumen cutback, cutback asphalt, petroleum coke, natural gas, hydraulic oil and quenching oil, as well as hard coal and coke and charcoal.

Other commodities listed include oil burners for homes, oil heating stoves and space heaters, and cook stoves using coal, gas, gasoline and kerosine.

Oil field equipment on the list includes rotary drill rigs with rotary tables; core drills, power augers, borers and parts; rock drill bits and reamers with diamonds; rotary rock drill bits, core drill bits and reamers and parts and accessories for them; percussion type drilling machines, parts and percussion drill bits.

Additives for lube and fuel oils, including antiwear and corrosion inhibitors, oxidation inhibitors and viscosity index improvers also are on the list.

The companion list of commodities on which the U.S. stands ready to talk tariff cuts on imports is relatively barren of petroleum products, except for numerous chemicals, tanks for gas or oil, and certain commodities related to the oil and gas industry.

U.S. industry was given until June 27 to file statements and requests to testify before the Committee for Reciprocity Information about the import and export lists and before the U.S. Tariff Commission about the import list. Hearings before each body were set for July 11.

Import Program to Supreme Court

The U.S. oil import program, which began March, 1959, now appears headed for a review by the U.S. Supreme Court.

Gulf Oil Corp., which is challenging the residual import quotas issued under the plan, promised to take the matter that high; the U.S. Department of Justice, defending the plan, indicated it will do the same if necessary.

Therefore, the high tribunal will have a chance in a year or two to rule that the program is legal and in line with the constitution, and being carried out in a fair manner, or it can rule to the contrary. Gulf contends that there is no valid reason for different standards for parceling out crude oil import quotas and product import quotas. It contends the crude oil quotas are based chiefly on current refining operations, but that product quotas are based on the history of imports. Mobil Oil Co. also is attacking the residual quotas in the courts.

Gulf lost the first round when U.S. District Court Judge Joseph McGarraghy tossed out its complaint and ruled for the DJ. The judge said there is no issue of "material fact" and that the residual rules are "fair and equitable." Gulf is moving toward the high tribunal by way of an appeal to the U.S. Court of Appeals.

Oil Labor Demands

One powerful group—labor—refuses to agree that the U.S. oil industry is in any slump. President O. A. Knight of the Oil, Chemical and Atomic Workers Union, in fact, is laying plans for new demands upon oil companies this year.

He is considering asking higher pay, shorter hours, perhaps to 36, to absorb workers displaced by automation, and a union-run fund to handle fringe benefits now being paid by companies. He sees this as amounting to $150 million a year on the basis of benefits of 40 cents an hour.

Statistics show that U.S. oil workers are at the top of pay scales for any workers in the U.S. Mr. Knight says the statistics also show: 1. Hourly earnings have climbed 58.8% for oil workers in the past ten years to an average of $2.97, but the real gain, adjusted for price rises, is only 29.3%. 2. The total of production workers on the job in oil refineries is only 118,200, down 17.6% from ten years ago, but crude oil throughput at refineries is up 50% to 7,989,000 b/d last year. 3. So, the number of production workers now used for each thousand barrels daily of throughput is now 14.8, a drop of 45% from the 26.9 ten years ago.

Mr. Knight sees oil refineries putting out more oil with fewer workers, and he faces two courses of action for the union. One is to help the refineries become more efficient, to do more with fewer workers, in the hopes this will add to profits, which can be used for higher pay for the workers on the job. The other is to try to persuade management to keep men on the payroll by shorter hours with no cut in pay or other steps, which could make it harder for companies to find money to raise wages.

FPC Vacancies

The Federal Power Commission, one of the most important government agencies, could wind up shortly with two vacancies and a problem in filling them.

President Eisenhower has announced he is dropping William R. Connole from the commission when his term ends June 22, 1960. John Hussey of Louisiana, the fifth member, died last spring.

For their places, the president named Paul A. Sweeney of Maryland, age 64, a Department of Justice career attorney, and Thomas J. Donegan of New York, an ex-FBI agent now a member of the Subversive Control Board. Senate Democrats appear reluctant to confirm the men, in hopes they will capture the White House in November and that the jobs can go to "deserving" Democrats.

When Congress closes in June, the president could give both recess appointments to serve until the next session of the Congress which starts in January. But both Sweeney and Donegan express doubts whether they would accept a short term assignment. Both would have to give up the jobs they now hold, and might find trouble getting other positions next year.

In the end, the president may have to turn to others for the short term assignment. It is unlikely he will name no one for the recess term, for that would leave the FPC with only three members, a minimum quorum. All three members would have to be present for voting or else the commission could take no actions. If one member became sick, or wanted to go out of town for vacation, or a speech, it would cripple the commission.

Oil Job Outlook Is Black

Now it's official that the oil industry has plenty of professional workers on the payroll. Secretary of Labor James P. Mitchell, reviewing job outlook for this year's crop of college graduates, had this to say: Petroleum engineers, the demand is "not so strong." Geologists, "few" jobs now, but more "over the long run." Geophysicists face "good" chances for jobs.

All in all, some geologists and petroleum engineers might be wise to take another degree, or settle for jobs in other than oil, he explained.

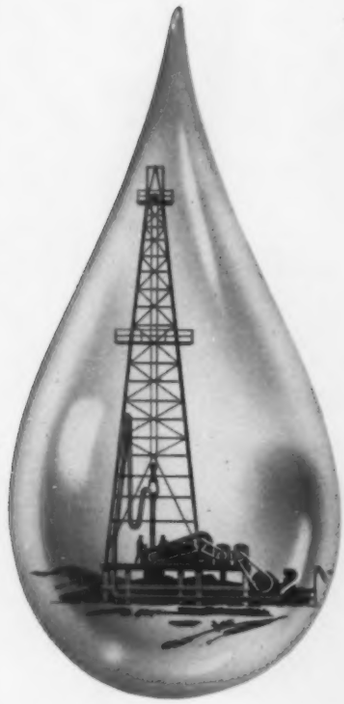
Pipelines for Rocket Fuels?

The pipe lines, now used widely for oil and natural gas, may also have a bright future in long distance hauling of liquefied gases for rockets, missiles and satellites. This is one tentative finding of a National Bureau of Standards study. Earlier, it was thought that the pipe line was useful only for short hauls for the liquid gases.

In theory, at least, it now has been found that the pipe line is useful for long distance hauling of liquefied hydrogen, oxygen, nitrogen and helium and other gases, used in chemistry, physics and engineering and, more recently, in missiles and rockets. The standard component is an insulated pipe, with pump stations along the line and stations along the line to cool the system by refrigeration or flashing.

The bureau now is checking the theory in actual tests on long distance transportation systems now being built for more information. R. B. Jacobs of the NBS Cryogenic Engineering Laboratory, Boulder, Colo., is conducting the study.

Ask "US" about oil



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Among the many U. S. Rubber products which have long served the oil drilling industry throughout the world are drill hose, mud pump, vibrator and suction hose, V-belts, pipe protector rubbers, fire hose, LPG hose, steam hose, sheet and V-type packings and rubber and friction tapes. Each and every one is a product of men who know the oil industry and its problems intimately. And the performance records these U. S. Rubber products have established assure you there are no better anywhere.

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—M. J. Rathbone, President

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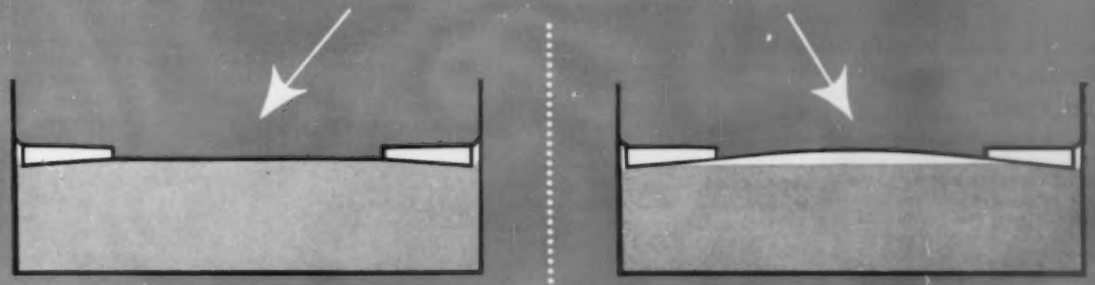

The Horton Pontoon Floating Roof has an annular pontoon around the outer edge of the roof and a deck of single thickness at the center. The pontoon provides effective air space insulation for a large area of the liquid surface. Under normal conditions, the underside of the Horton Pontoon Floating Roof is in contact with the product in the tank.

Increased temperatures may cause the product in the tank to boil. Should this occur, the vapors are trapped beneath the center section of the roof due to the upward slope of the pontoon bottom and the flexibility of the center deck. The trapped vapors lift the center of the deck and provide an insulating vapor space to reduce further boiling.

130,000-bbl. tank equipped with a Horton Pontoon Floating Roof serves the marine loading terminal of a West Coast oil company.

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The sun's rays striking the single deck portion of a floating roof heats the deck and the product beneath. Boiling often occurs, causing vaporization. Unless these vapors are retained by the deck rising from the product, boiling will continue. Horton Pontoon Floating Roofs trap these vapors. They form an insulating space during the heat of the day retarding further boiling. As cooler temperatures occur, the vapors recondense and the deck returns to the liquid surface. The result: *Maximum protection against costly evaporation loss and deterioration of product.*

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Minister of Power On "Logical Fuel Policy"

The answer to Britain's future fuel needs lies not in restricting oil imports, which would bring penalties to exporters and hinder new developments, but in measures such as those being taken by the National Coal Board to increase efficiency and production and to provide improved service to customers, said the Rt. Hon. Richard Wood, MP, Minister of Power, guest of honor at the annual luncheon of the Institute of Fuel in London. A crowded and enjoyable occasion, this was presided over by Dr. A. C. Monkhouse, CBE, who said the minister has a difficult task. He is responsible for the three nationalized industries—coal, gas and electricity—and he has to keep an eye on the rapidly growing oil industry. All would wish him well in his office.

Rt. Hon. Richard Wood, Minister of Power, speaking at the annual luncheon of the Institute of Fuel.

Mr. Wood said he regards his responsibilities as those of coordinator, supporter and helpful observer of the fuel and power industries. The government has a national fuel policy, although sometimes it is implied that no such policy exists. It is very clear and logical, "to provide the fuel the country needs as efficiently and as cheaply as possible. The government believes that this will be achieved best and most easily by fair competition between industries, which allows the user of fuel to be the best judge of what he wants to use. If the government, as some people suggest, was to lay down arbitrary rules on fuel usage, life may be more comfortable for certain people for a short time, but I am quite certain that in the long run the country would suffer from an inflexible and uneconomic fuel supply. We in this country are far too dependent on overseas trade to be able to afford to reduce the competitive strength of our manufacturing industries."

Tenders For A Nuclear Tanker

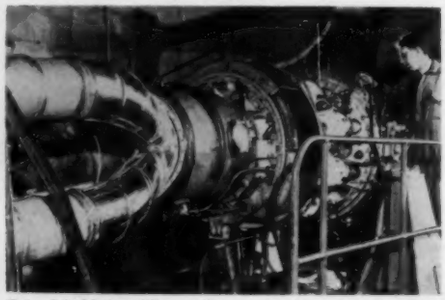
The government has invited tenders from five nuclear power groups for two types of nuclear reactor suitable for installation in a 65,000 dwt tanker, with the closing date set for July 29. Announcing this, the Minister of Transport said a decision whether to build a tanker and which type of reactor it should have would be made in the light of what the tenders disclosed and of the progress with other types of reactor which show promise of application to shipping. The ultimate objective is to build a nuclear powered ship economically competitive with a conventional one. Anything that is not competitive is unlikely to survive.

Less Detergent Foaming

Since 1957 the Committee on Synthetic Detergents —an independent body of experts appointed by the government—has been studying the problems in sewage works and waterways due to the foaming associated with the growing use of synthetic detergents. Its third progress report, just published, points the way to easing these problems very considerably.

Large-scale trials are described with an alternative active material which is "biologically soft," i.e., it is largely destroyed by bacteria in sewage plants, thus removing the cause of subsequent foaming. Although manufacturers' efforts in the two towns chosen to see that all packeted detergent sold contained the new material alone was only 70% successful, the committee reports very definite evidence of reduced foaming problems. The trials are continuing under better sales distribution methods and meanwhile the tentative conclusion is drawn that while the new material is not completely removed during sewage treatment—94% is reported against 68% of the old detergent—its substitution for the material now in general use would substantially diminish the troubles associated with synthetic detergents. The committee also discusses the apparent differences in chemical nature between the old and new materials.

The latter, it can be added, has been developed in Shell research laboratories and steps have been taken to make it in "substantial quantities" at the Shell Haven detergent alkylate plant.



Bristol-Siddeley "Proteus" power plant for the Bluebird undergoing test runs.

Bluebird Fuel and Lubricant

British Petroleum Co. is providing all fuel and lubricants for the new Bluebird in which Donald Campbell will attempt next September at Bonneville Salt Flats, Utah, to best the world's land speed record of 394.196 mph.

This is powered by a Bristol-Siddeley "Proteus" gas turbine engine delivering 4,100 shp at 11,000 rpm, modified to drive from both ends. Apart from the actual fuel—aviation turbine kerosine—BP will supply seven different types of lubricating oils and greases. This has involved a long period of research and testing, one of the most difficult manufacturing problems being blending a lubricant for the gear units—where the load will reach over 4,000 psi. There are two main requirements: the shaft bearings require a free-flowing thin oil in sufficient quantity to circulate rapidly and cool the rolling surfaces, while at the same time it has to be thick enough, with a high film strength, to prevent metal to metal contact.

Bulk Depot In Scotland

Mobil Oil Co. Ltd. has opened its first bulk oil distribution depot in Scotland to serve its increasing automotive fuel interests north of the border. This is at Bathgate in west Lothian, midway between Edinburgh and Glasgow.

Built by John Laing & Son Ltd., this has five storage tanks with a combined capacity of 60,000 gallons of gasolines, diesel and gas oil, but there is room for appreciable expansion. An all-electric system provides separate pumping and piping for each product and the plant will be supplied by road tanker from the company's sea-fed terminal at Sunderland.

US Equipment Links

A special feature of the exhibition organized recently by Dewrance and Co. Ltd., one of the world's foremost valve manufacturers, was the introduction of the Dewrance Microsen process control equipment systems, the complete range of which is now being made under license to Robertshaw-Fulton Controls Inc., Calif. Dewrance has also recently negotiated an exclusive manufacturing license with Automotive Switch Co., New Jersey, for ASCO packless solenoid valves and it is planned to bring the complete range into production as quickly as possible.

Since its association with the Born Engineering Co., Tulsa, which started about a year ago, H. & E. Lintott Ltd., of Horsham, Sussex, has received contracts for 14 direct-fired Born process heaters of vertical or horizontal design, with capacities ranging up to 13½ million Btu/hr. In some cases contracts have included Lintott instrumentation. No less than six heaters are for chemical plants and refineries in the Melbourne area, Australia and at least one contract has been placed by an American firm. The company announces that a further new shop should be in use towards the end of the year to facilitate manufacture and assembly of the popular completely prefabricated type of heater.

Appointments

N. A. ILIFF has become managing director of Shell Chemical Co. Ltd. in succession to **L. H. WILLIAMS**, who is to take up a new executive appointment in Shell International Petroleum's chemical organization.

N. A. Iliff

E. F. Choppen

E. F. CHOPPEN has resigned from the Esso Petroleum Co. board following his appointment as deputy coordinator of the worldwide marketing operations of Standard Oil Co. (New Jersey) and is now in New York.

CAPTAIN ROLAND GEORGE MOTT has been made commodore of BP Tanker Co., succeeding Commodore H. I. Michael, OBE, who has now retired. He has also been appointed to command the company's latest supertanker, the 50,000 dwt "British Queen."

M. A. L. BANKS has been appointed a director of British Petroleum Co. to fill the vacancy caused by the retirement of the chairman, Sir Neville Gass.

C. L. NELSON has been appointed managing director of Ultramar Co. and **J. M. SHAHEEN** has been made a director.

A. J. C. MOORE, Regent Oil Co. manager of industrial sales, has been appointed assistant general manager and his duties have been taken over by **H. TAYLOR.**

(*Continued on page* 10)

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JOHN LINTON BLACK, staff manager of Shell Refining Co. at London head office since April 1959 and deputy to the personnel director, has been appointed general manager of Shell Haven refinery in succession to James Grant, who has retired. Mr. Black, who joined Shell in 1935, has held import and technological posts in many parts of the world, and he has now returned to the scene where for a period years ago he was assistant refinery manager.

J. L. Black

N. Harrison

NORMAN HARRISON has been appointed chief marine engineer of Wakefield-Dick Industrial Oils Ltd. Mr. Harrison joined the company in 1955, after extensive engineering experience with various shipping lines, as a technical sales representative in Liverpool, and was transferred to the head office in London in 1957 to take charge of the technical department of the marine division.

British Equipment Notes

Foster Wheeler Ltd., has been awarded the contract for a complete "grass roots" refinery for Dansk Veedol A/S at Kalundborg. Initial capacity will be 20,000 b/d but vessels will be designed for a future 40,000 b/d and one of its features will be air fin coolers. This is the fourth complete refinery contract FW Ltd. has been awarded in the last three years and it was secured against strong international competition.

The English Electric Co. Ltd., announces a new compact metering set for AC welding production, research and development by which the user can see at a glance the arc voltage and current and also the total energy being consumed. It has many uses for measurement purposes for energy consumption over short periods and is equipped with a relay to give protection against overcurrent in the event of the meter being used with an incorrect current transformer ratio.

The Perkins Engine Co. Inc. has been formed in the US, with headquarters at Detroit, to market the products of F. Perkins Ltd., of Peterborough, and to expand the already substantial American sales of Perkins power units covering a wide field of applications. J. Peter Allan (executive vice president) is in charge of this new company, and the other directors are M. I. Prichard (president), T. H. R. Perkins and Marion S. Harlan.

Richardsons, Westgarth & Co. Ltd. announces that the group has recently received an order from a major oil company for eight combustion gas turbo-compressors for installation overseas.

Watts Fincham Ltd., associate of the International Paints group, is transferring its London depot to a new building in Thames Road, Barking, Essex, next October. New stores are also being planned at Milford Haven to cater for stores to shipping in an area with an enormous potential.

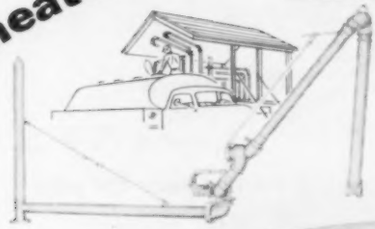
The A. P. V. Co. Ltd. celebrated its Golden Jubilee in June and the wide range of its current activities is well illustrated in a commemorative brochure "APV 1910-1960." The company was the first to produce large vessels in aluminum as the industrial application of this metal had previously been handicapped by welding difficulties.

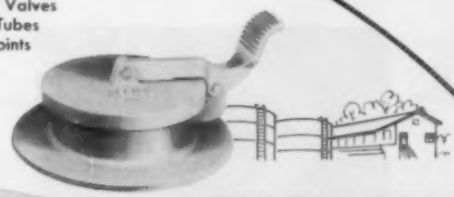
Lake & Elliot Ltd., manufacturers of refinery fittings, celebrated its Golden Jubilee as a company in June. Actually the business was founded by William Beard Lake in 1892 and became a company when he was joined by Mr. Elliott in 1910. The occasion is marked by a 60-page historical brochure of much interest—incidentally produced under the chairmanship of Crompton John Lake.

"Wheaton Covers the World"

TERMINAL EQUIPMENT

Loading Assemblies
Loading Valves
Sliding Tubes
Swing Joints



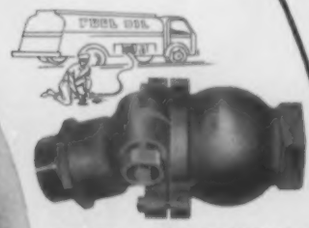


STORAGE TANK EQUIPMENT

Breather Valves
External Valves
Gauge Hatches
Tank Gauges
Thermometers
Vent Valves
Water Drain Valves

Wheaton

can supply you with quality fittings *wherever you need them*



TRUCK TANK EQUIPMENT

Emergency Valves
Emergency Valve Operators
Multiple Valves
Truck Tank Faucets

AIRCRAFT FUELING EQUIPMENT

Coupling Strainers
Floating Suctions
Hydrant Cart Loaders
Hydrant Pit Valves
Pressure Control

Wherever petroleum, chemical or petrochemical products are refined, stored or marketed, Wheaton fittings can facilitate the operation and reduce maintenance costs.

Wheaton pioneered the development of loading arm assemblies and truck tank faucets, and applies this experience to a line of loaders, valves, swing joints, faucets and gauges that are *first in quality* all over the world.

Whenever you use Wheaton fittings, you utilize Wheaton's 68 years of product development and improvement. And wherever you need Wheaton fittings you are assured of prompt service by their world-wide manufacturing and distribution.

There is a Wheaton plant near you – with fittings that offer the best solution to *your* liquid handling problems. Send today for new Catalog No. 68, which describes the complete line.

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Loading Arm Assemblies, Swing Joints, Loading Valves, Storage Tank Fittings and Truck Tank Equipment for the Petroleum and Chemical Industries

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*A SUBSTANTIAL INCREASE IN PROCESS CAPACITY will be needed by 1962, according to reliable estimates...NOW is the time to start your planning!

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REACTORS AND TOWERS THAT PRODUCE PROFITS . . .

One thing petroleum, petrochemical and chemical plants have in common: Each consists of reactors, piping, tanks, towers, heaters, pumps and other components that must work together to produce profitable products.

Your new processing facilities do just that when you entrust the job to Procon. A world-wide organization specializing in process construction, Procon builds, within your budget, plants that not only meet full performance specifications, but often exceed them!

Before you get too far in planning your next move, call in Procon. We'll be glad to discuss your needs with a view to preparing a detailed proposal.

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THE NEW EZY-VUE PRESSURE GAUGE

Gauge shown ACTUAL SIZE

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Accurate
PRESSURE GAUGE

For Applications Requiring

RUGGEDNESS and DEPENDABILITY

CAPACITIES: 3,000 lbs., 5,000 lbs., 6,000 lbs., 10,000 lbs., 15,000 lbs.

Write for Bulletin WP-P95

MARTIN-DECKER CORP.
HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

CANADIAN NOTES

To Map N. Saskatchewan

Surveying and mapping of extensive areas of Saskatchewan's northlands will be carried out this summer by the provincial department of mineral resources. Eight field parties, comprising five-man teams of geologists will work in the Precambrian Shield for a period of approximately four months, and at the close of the field season their findings will be reported, mapped and released for publication.

New Home for Home Oil

Home Oil Co. has completed plans for a six-story, $1,200,000 addition to the Brown building, the company's head office at 304 Sixth Avenue West, Calgary. Its completion by the end of this year will enable the company to consolidate all its departments under one roof.

Can Transport Gas Liquids

Interprovincial Pipe Line Co. is prepared to transport natural gas liquids when the supply and markets are available. According to T. S. Johnston, president, the subject has been under intensive study, he said.

1959 Statistical Year Book

The newest edition of the Canadian Petroleum Association Statistical Year Book is available from the Association's Calgary offices at $3 per copy. The year book, gives an up-to-date comprehensive survey of the Canadian industry for 1959 and earlier years.

BA Builds Marine Terminal

British American Oil Co. Ltd., will build a marine terminal near Point Tupper on Nova Scotia's Strait of Canso. First deliveries are scheduled for next spring.

Hudson's Bay Promotions

Three production department promotions were announced today by Hudson's Bay Oil and Gas Co. Ltd. S. G. Olson has been promoted to assistant general manager of production replacing D. Carlton Jones who was recently appointed a vice president and general manager of the production department. Mr. Olson, formerly superintendent of the company's Calgary district, joined Hudson's Bay Oil and Gas in 1952 following four years' service with Continental Oil Co.

E. J. Chaput, formerly assistant Calgary district superintendent, was promoted to superintendent of that district and G. J. Maier, senior staff engineer was promoted to assistant superintendent of the Calgary district.

Opens Canadian Office

United Producing Co., Inc., oil and gas subsidiary of United Carbon Co. has opened a Canadian area office at Calgary with James J. Statler as Canadian area manager. The Calgary office is the second international area office opened by United Producing in the past year. An office in Guatemala City, Guatemala was opened last June.

Heads Crose-Curran Ltd.

Bud Glenn, formerly branch manager at Toronto, has been promoted to manager of operations for Crose-Curran, Ltd. in Canada at the main office in Edmonton. Mr. Glenn will be assisted in the Edmonton area by Harvey Gordon in the sales department, Mr. Bob McLean as office manager, and Mr. Hill Clark who heads up the shop and service departments. Other appointments at this time, are those of Roger Garneau as office manager of the Toronto division, and Frank Munshaw, formerly of Cessco, in charge of sales and services for the Toronto area.

Newfoundland's 1st Refinery

Ultramar Co. Ltd. has formed a wholly owned subsidiary called Golden Eagle Refining Co. of Canada Ltd. which will carry on petroleum refining and marketing in eastern Canada. Golden Eagle signed an agreement with the province of Newfoundland providing for construction of a 5,000 b/d refinery at St. John's, Newfoundland, to be the first oil refinery to Newfoundland.

More Canadian Gas for USA

An FPC examiner has approved a mammoth natural-gas supply plan which would bring 584.5 million cubic feet of Canadian gas daily into western USA. The import plan goes into effect within 30 days if not reviewed or rejected by the full commission. It involves almost three ttimes as much Canadian gas as the plan, already fully approved by the FPC and Canadian authorities, for Midwestern Gas Transmission to bring in 204 mmcf per day for use in the upper Midwest. Noting that Canadian gas prices are not regulated, the examiner conditioned his approval on agreement by USA and Canadian companies to keep the FPC informed on price factors so the agency can protect USA consumers.

Bannister Election

Bannister Construction Co. Ltd., has appointed A. J. Cressey as vice president in charge of the heavy construction division and O. Johanson vice president in charge of light construction. Eric Fichtner was named vice president, controller and secretary.

First N.W.T. Gas Strike

First natural-gas discovery in the Northwest Territories was by a consortium of Home Oil Co. Ltd. (operator), Signal Oil & Gas, United Oils, Kern County Land Co., and Alminex Ltd. Flow rates for Celibeta No. 2 gas discovery, near the B.C.-N.W.T. border, recorded up to 6 mmcf/d from the Slave Point formation.

Athabasca Sand Conservation

Premier E. C. Manning of Alberta has introduced a bill in the provincial legislature to bring Athabasca bituminous sands under direct control of the conservation board, with power to proration production. The Act will plug possible gap in conservation law which might have permitted unlimited production. The Premier said his provincial government wants commercial process developed, but no actual production.

Alberta Liquid Gas Surplus

Alberta will have surplus of 92,000 b/d of natural-gas liquids when full-scale gas export starts, probably late in 1961. Export markets must be found, as domestic use would only displace crude oil. Large plan for $150 million pipeline to Chicago is being promoted by Pembina Pipeline Ltd. for disposal. First filing has been made with Alberta Conservation Board.

Geophysical Slump

Geophysical exploration has been having its worst decline in history, with mid-April showing only 24 crews at work, lowest figure in at least 13 years and less than half last year's 49 crews in April. Four months' cumulative crew-months were down 14% to 320, from 372 last year. Forecast of year's total is 700 crew-months for 1960.

Avgas Line from Edmonton

Trans-Prairie Pipe Lines Ltd. has applied for permission to build an $800,000 16-mile 3-in. products pipeline from the Edmonton refinery area to the new Nisku airport, to transport avgas.

Production Down

Alberta is due for a few more months of tough sledding in oil production. The Conservation Board has announced refiners' nominations of 329,115 b/d for April—down from 52,000 b/d from the March allowable and up only 21,000 b/d from April 1959. May is estimated as 350,639 b/d—up from 300,820 b/d last May; but June is forecast to drop to 333,113 b/d, down from 352,092 b/d last year.

Canada's Refining Up

Refinery crude receipts in Canada during 1960 are forecast to be only slightly above 1959. The Dominion Bureau of Statistics calculates average 735,000 b/d for the full year, compared with 783,000 b/d last year. Forecast is for a 3½% increase in domestic crude receipts but a 3% decline in imported crude.

Kotcho Gas Find

Pacific Petroleums Ltd. reports its North Kotcho NO-B-44C discovery in Kotcho Lake area, northwestern British Columbia, has rated an open-flow potential of 105 million cubic feet of gas daily from the Slave Point. A stepout is being drilled 3½ miles north which already has encountered gas in the Mississippian. Company says recently drilled wells at Kotcho have been among largest in Canada; the district now is considered one of the most prolific gas areas in the Canadian West.

California's Gas Market Slowed

Holding up of construction on the California section of the proposed 1,400-mile 36-in. gas line from Alberta to San Francisco has been recommended by California's public utilities commission, on the ground the favored-nation and stepwise escalation clauses in gas contracts with Canadian producers who are to supply the Pacific Gas & Electric line might lead to unreasonable price increases to California consumers. Canadian approval to export gas through the $340 million line was granted recently.

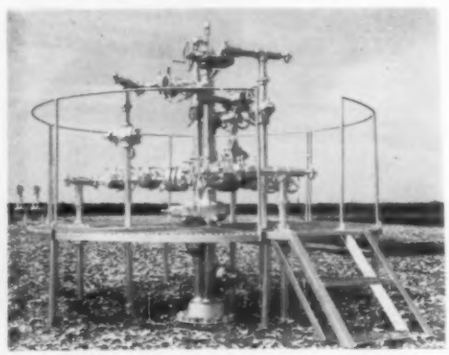
Personals

JAMES R. MURRAY and **MILTON J. FOLEY**, have been appointed directors of Hudson's bay Oil and Gas Co. Ltd., at a directors' meeting in May. Mr. Murray is the company's general manager for Canada. In October of last year he was appointed managing director of the Hudson's Bay Co.

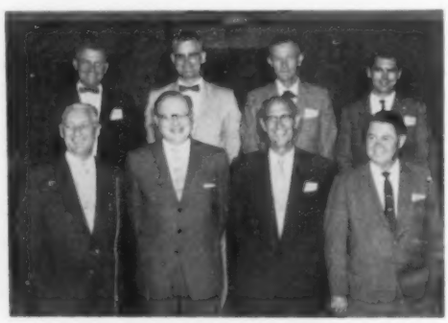
D. CARLTON JONES has been appointed a vice president of Hudson's Bay Oil and Gas Co. Ltd.

JAMES M. MacNICOL has been appointed manager of the Saskatchewan division of the Canadian Petroleum Association, headquartered in Regina.

MAX C. GOVIER, treasurer of Home Oil Co. Ltd., was elected a vice president and director while **RONALD B. COLEMAN** was appointed secretary.



The world's first six-string Christmas tree at Sunray Mid-Continent Oil Co.'s sextuple completion in the North LaWard field, Jackson county, Tex. The six-in-one well flowed 2,770,000 cubic feet of gas a day through various size chokes from six zones ranging from 4,600 to 6,650 ft.



International guests and speaker at the May meeting of the Los Angeles Chapter of Nomads. From left to right (front row) J. R. Tomlinson from Mexico; N. E. Shafer, speaker; Tommy Thompson of Brantly Drilling Co. from Brazil; George Murray of Petrobras from Brazil; (back row) Fred Large of International Industrial Services going to Libya; Fred Peveto of Camdrill from Libya; Paul A. David of Petrobras from Brazil; H. J. Clarke of British Petroleum from Das Island.

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THE PROCESS THAT PRODUCES A NEW KIND OF JET FUEL OFFERING BIG AND EXCITING POSSIBILITIES

Jet flight is here to stay. But jet *fuels*, like yesterday's gasolines, will be replaced by better, more improved types . . . the kind made possible by Molex.

A unique, new *continuous* process developed by UOP, Molex removes up to 99% of the normal paraffins in gasoline mixtures, produces a superior jet fuel with these exclusive advantages:

Higher heating value per pound
. . . for greater range or payload.

Lower luminosity
. . . for lower metal temperatures, less carbon deposit, lower overhaul expense.

Less smoke in engine exhaust
. . . for more effective smog control.

High thermal stability
. . . eliminates heat exchanger fouling.

'62 COULD BE THE YEAR FOR YOU!
The consensus of informed opinion is that 1962 will require a substantial increase in process capacity . . . NOW is the time to start your planning! Ask us about a preliminary proposal, no obligation!

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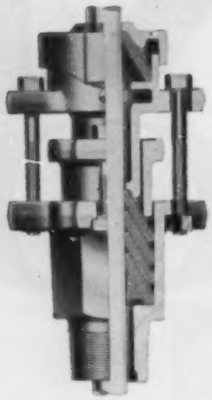
WHERE RESEARCH TODAY
MEANS PROGRESS TOMORROW

HERCULES CONE PACKED STUFFING BOXES

Provide the ultimate in SAFETY, ECONOMY and EASE of operation

Hercules Stuffing Boxes — like all Hercules Products — are improved constantly to meet the changing needs of the industry and are available in three styles. They are used internationally and are available through supply houses, everywhere.

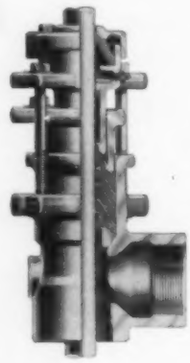


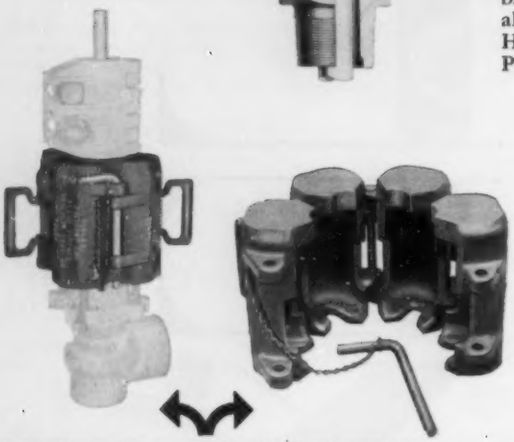
HERCULES REGULAR TYPE DUPLEX STUFFING BOX

More efficient operation with fine adjustment possible. Offers longer packing life due to ability of Packing and Glands to follow lateral movement of Polished Rod. Malleable iron construction prevents breakage if rods are accidentally dropped on Stuffing Box. Has male thread to screw into Pumping Tee.

HERCULES TEE TYPE DUPLEX STUFFING BOX

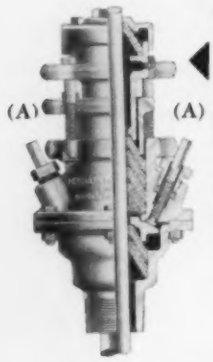
A combination Tee and Stuffing Box only 15" high. Eliminates one threaded connection between Stuffing Box and Tee. Full opening — allows rods to be run or pulled without removing Stuffing Box body. Has female thread to screw directly onto tubing.





HERCULES POLISHED ROD CLAMP-OFF SUPPORT

Used with Hercules Regular and Tee Type Stuffing Boxes to *prevent accidents* or personal injuries while clamping off. Manufactured from high tensile aluminum alloy, will safely support 30,000 lbs. weight.

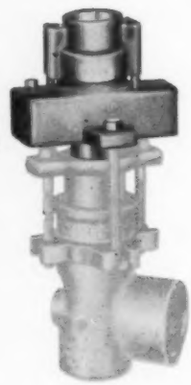


HERCULES TYPE DP (Double Packed)

Duplex Stuffing Box for use on high pressure or intermittently flowing wells. Allows Main (upper) Packing to be safely and easily replaced while well is under pressure. The two compression bolts (A) are turned clockwise until the lower Packing seals off. The Main Packing can then be removed and replaced.

HERCULES OIL RESERVOIR GLAND

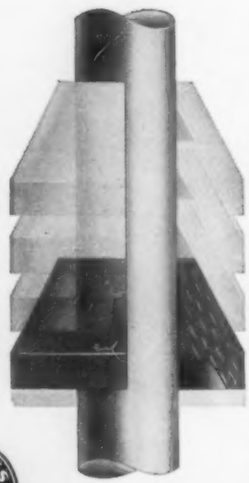
All Hercules Stuffing Boxes may be equipped with *Oil Reservoir Upper Gland* on *problem* wells which pump off and burn packing. The polished rod runs through the Reservoir, and is cooled and lubricated by its fluid.



For Best Results in Hercules Stuffing Boxes, use only

HERCULES CONE-SHAPED PACKING RINGS

Each set of Hercules Cone-Shaped Packing Rings now include the NEW, SOLID Split Bottom Cone Packing Ring. This new solid ring provides greater contact with the polished rod and a more substantial base for the upper Packing Rings, resulting in *longer* packing life and superior performance. A complete set now consists of three *regular* and one new split *Bottom Cone* Ring.



THERE'S A TYPE SPLIT CONE PACKING RING FOR EVERY REQUIREMENT:

Hercules Split Cone Packing Rings come in four grades: SOFT, HARD, SPECIAL LUBRICATED and HEAVY DUTY. SOFT Rings are always used with bronze liners or with steel polished rods in wells which are not always pumping fluid. HARD Rings are recommended for steel polished rods only, and where fluid is constantly being pumped. SPECIAL LUBRICATED Rings are recommended for problem wells which pump off persistently. When well is pumped dry, the rings lubricate the polished rod and prevent the packing from burning until fluid is again present. HEAVY DUTY Rings are recommended for problem wells. Properly adjusted, they give phenomenal life.

ACCEPT NO SUBSTITUTES

Ask for and accept only Hercules Cone-Shaped Packing Rings for use in all HERCULES Duplex Stuffing Boxes. All HERCULES Products are available through Your Supply Store.

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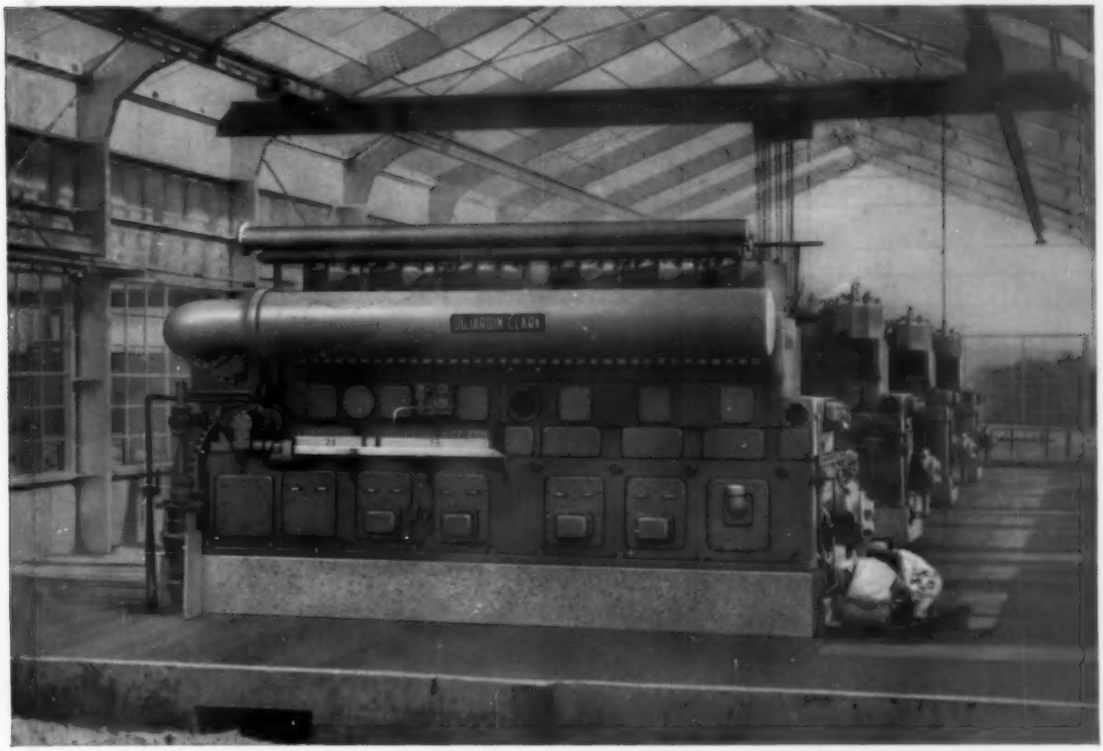


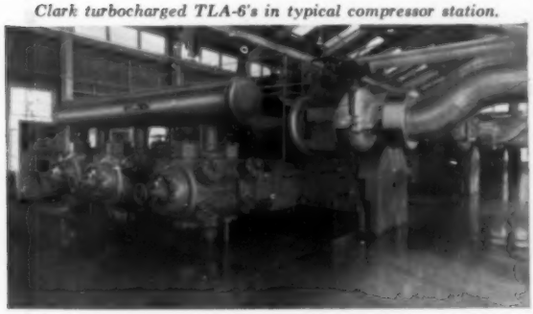
Twenty CLARK Turbocharged TLA-6 Compressors selected by Argentina's YPF

On the newly completed 22" and 24" Campo Duran gas pipeline in Argentina, there will always be extra compressor power on hand to meet emergencies. Each of the twenty Clark turbocharged, two-cycle TLA-6's was designed specifically for 2,000 bhp, with no encroachment on overload carrying ability.

In specifying Clark TLA-6 gas-engine-driven compressors, YPF engineers gave full consideration to proved dependability, economy of operation, and the fact that the new Clark cylinder and valve design increases compressor efficiency by 15%. In fact, the recently introduced Clark low ratio compressor cylinder and matching nylon poppet valve assure unequalled loading flexibility plus optimum compression efficiency at ratios of 1.2 or less.

There are seven models of Clark TLA and TRA compressors available in the 1100-3400 bhp range, whether manufactured under license in Europe or in the Clark home plant in the U.S.A. All units and components are identical and completely interchangeable. For complete data, consult the nearest Clark office listed below.

Clark turbocharged TLA-6's in typical compressor station.



CLARK COMPRESSORS ENGINES • GAS TURBINES

DRESSER INDUSTRIES INC. OIL • GAS • CHEMICAL ELECTRONIC • INDUSTRIAL

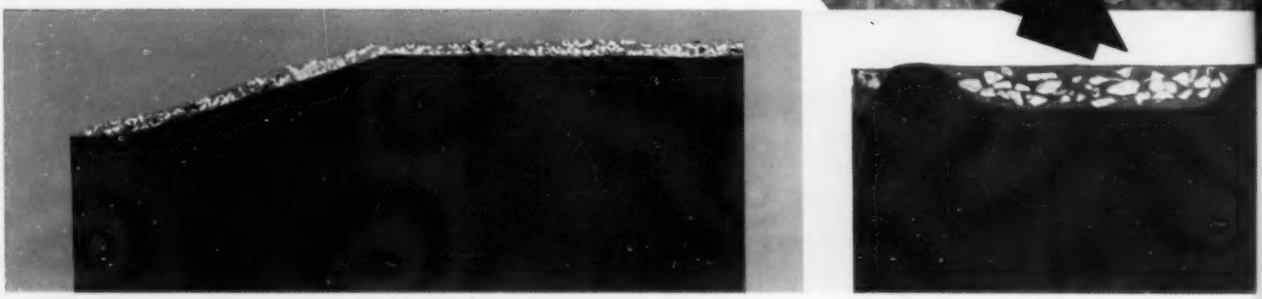
CLARK BROS. CO. OVERSEAS OPERATIONS DIV. *122 East 42nd Street, New York 17, New York* • **CLARK BROS. CO. DIVISION, DRESSER (GREAT BRITAIN) LTD.** *197 Knightsbridge, London S.W. 7, England* • **CLARK BROS. CO. DIVISION, DRESSER (FRANCE) S. A.** *37, Ave. D'Iena, Paris 16, France* • **CLARK BROS. CO. DIVISION, DRESSER ITALY S.p.A.** *Piazza Cavour, 3, Milan, Italy*

HUGHES

hardfacing

doubles – often triples – life of your tool joints

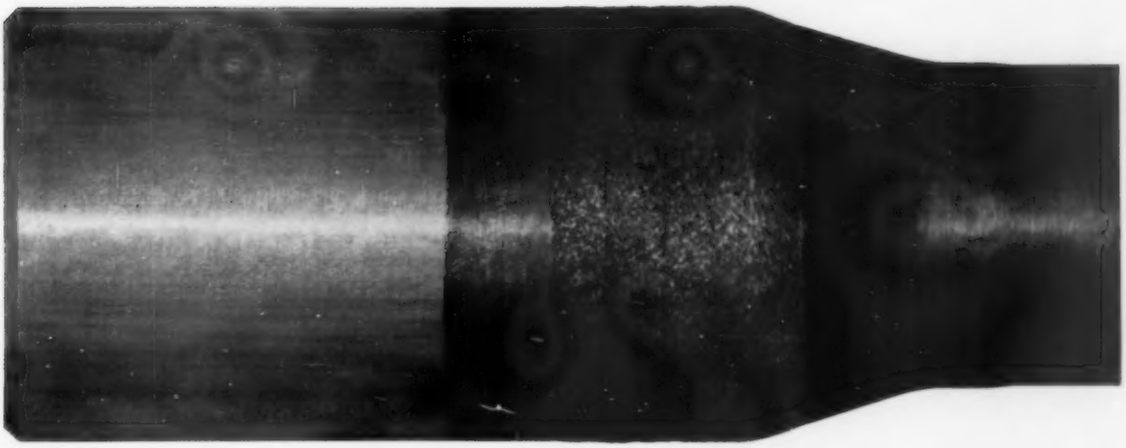
There are three outstanding reasons why Hughes hardfacing gives your tool joints long, superior protection against wear: 1) Quality of the hardfacing material – *Hughesite* – 25 times more wear resistant than hardened steel. 2) Method of application which assures an even distribution of *Hughesite* particles in the hardfaced bands. 3) Inspection of hardfacing to check the bonding of the hardfacing to the parent metal of the tool joint.



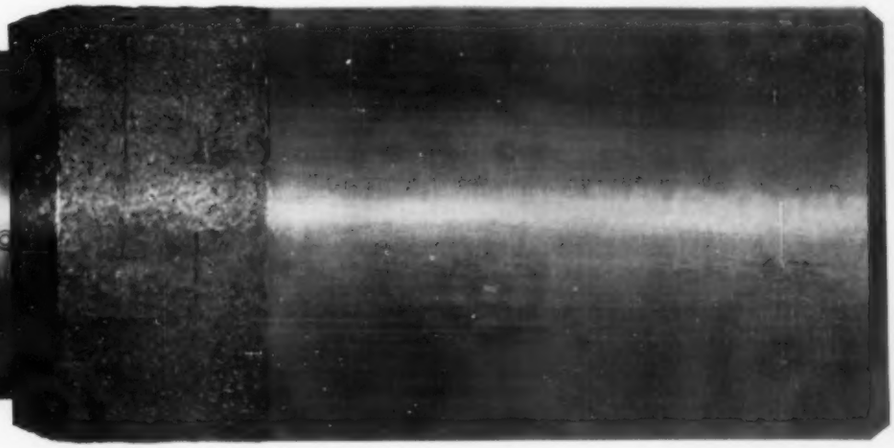
HARDFACING AS SEEN BY METALLURGICAL CAMERA. Large photograph, top, is a photomicrograph of a pinpoint of *Hughesite*, magnified 2,000 times. The cross section of a single band of hardfacing, right – magnified about three times – shows the even distribution of *Hughesite* particles throughout the hardfaced area. This assures uniform wear resistance during life of the hardfacing. The photograph at the left is a section through one of the fingers of hardfacing. These fingers provide continuous hardfacing through the circumferential lands and down the tapered elevator shoulder to provide maximum protection for the lands and elevator shoulder.

Hardfacing in depth was pioneered by Hughes to lengthen tool joint life. Developed and manufactured by Hughes and adapted to tool joint hardfacing, *Hughesite* is a *pure* tungsten carbide, many times harder than the hardest mineral formations encountered in oil well drilling. It is the hardest material that can be successfully used to hardface tool joints. Because of its fine-grained structure (see the color photomicrograph), *Hughesite* possesses the unique combination of hardness and toughness needed to withstand shock and abrasion.

The even distribution of *Hughesite* particles, achieved through the Hughes method of applying the hardfacing, assures *uniform resistance to wear* during the



"FLASH-WELD" tool joints – taper and square shouldered – are hardfaced with three, four or five bands of *Hughesite*. Five are standard on taper shouldered and four bands on square shouldered joints and are recommended where severe wear conditions exist. Fingers of hardfacing extending through the circumferential lands and onto the elevator shoulder on both taper and square shouldered joints, protect against undercutting in these critcial wear areas.



"SEAL-GRIP" tool joints are available with three or four bands of hardfacing. Four bands are standard. Sled runner design and interruption of the guide ribs with hardfacing provide a wear-resistant surface that protects the guide ribs and adjoining surfaces against undercutting.

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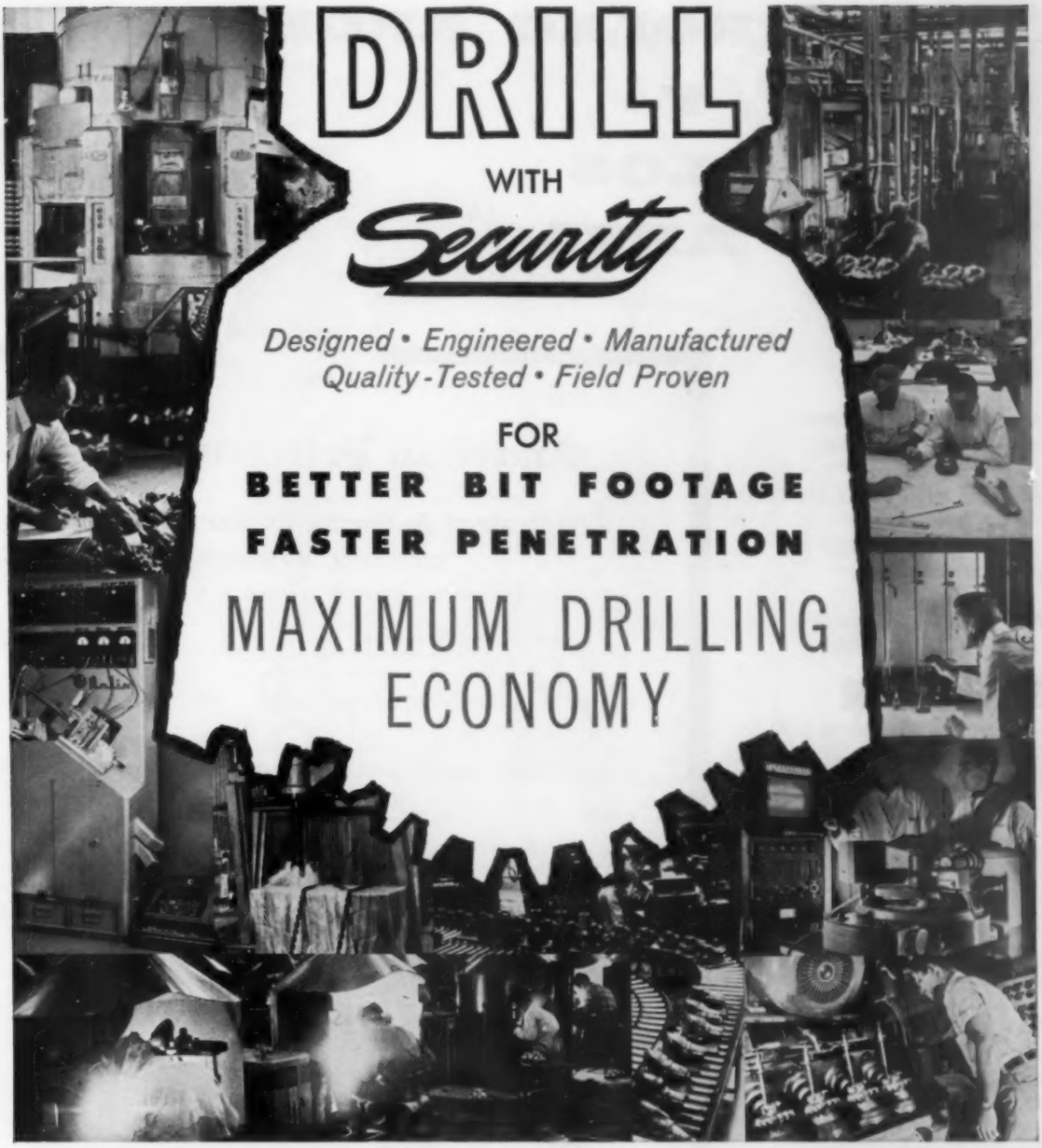

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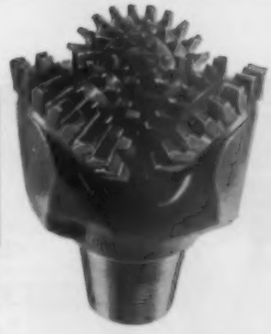

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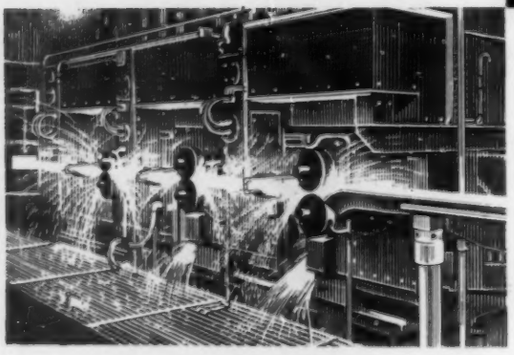

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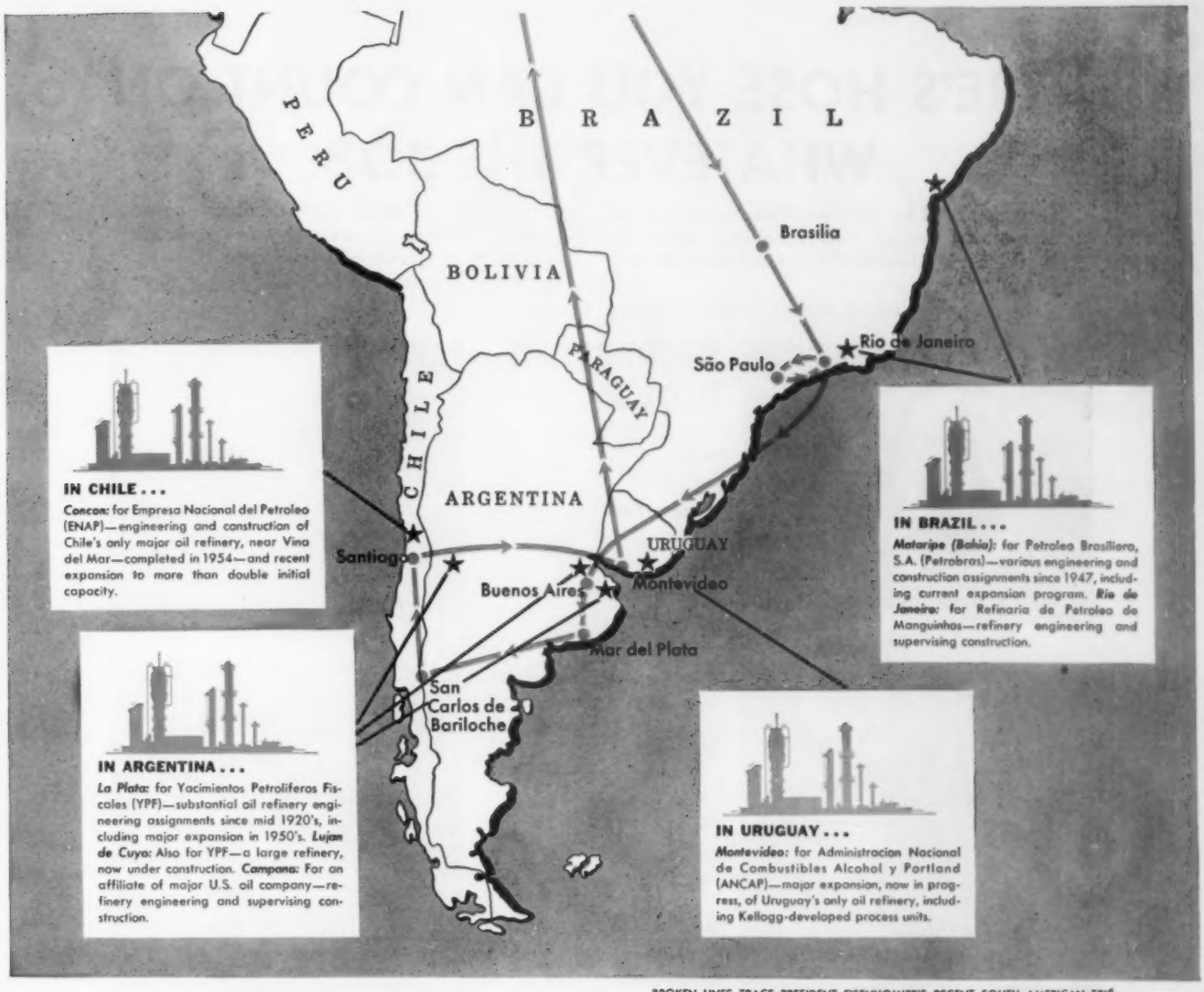
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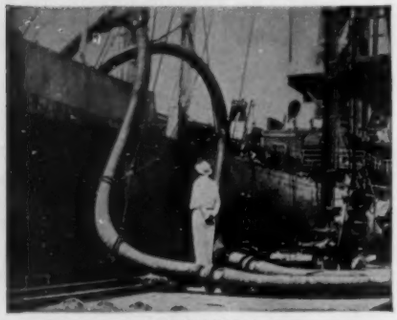

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Disintegrating spacers are supplied to provide fewer shots per foot when required. Any number of Mac-Jet units may be run in any length desired.

SPECIFICATIONS:

	1 11/16" OD	2 1/16" OD
Pressure, Temperature Rating	15,000 psi. @ 300°	13,500 psi. @ 300°
Maximum Temperature	350°	350°
Total Charge Weight	12 grams	20 grams
Av. Penetration (Berea Sandstone)	5.69"	7.45"
Av. Entrance Hole	13/32"	3/8"
Av. Well Flow Index	1.1+	1.44
Fill-up – 1' Gun, 5½" Casing	1"	–
Fill-up – 1' Gun, 7" Casing	½"	1"

Standard Berea Sandstone target perforated by 1 11/16" OD Mac-Jet. Average penetration, 5.69"; average entrance hole size, 13/32; average well flow index, 1.1+

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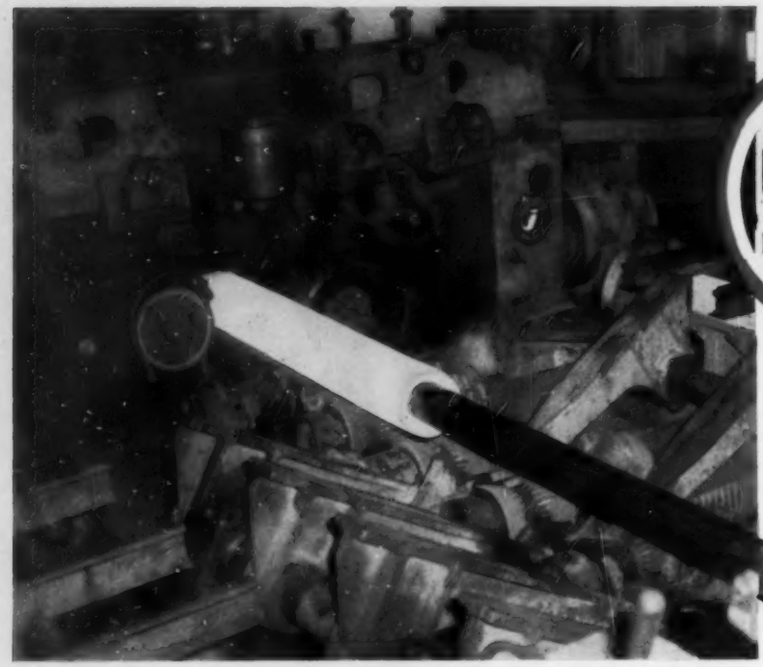

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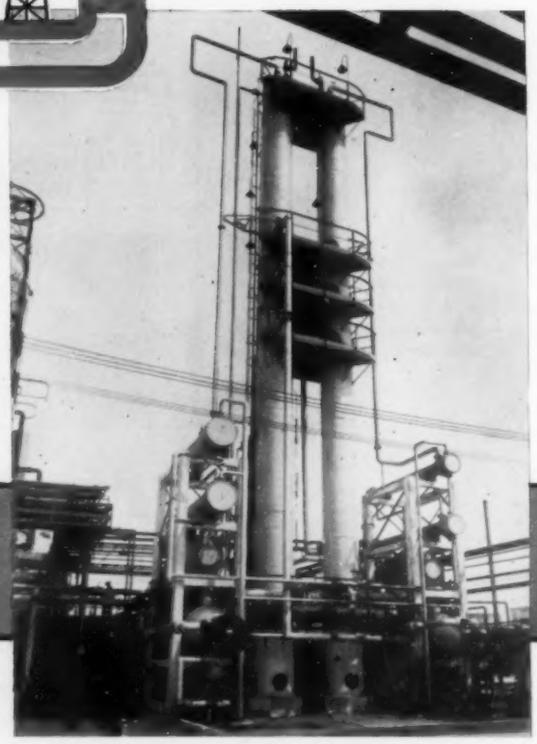

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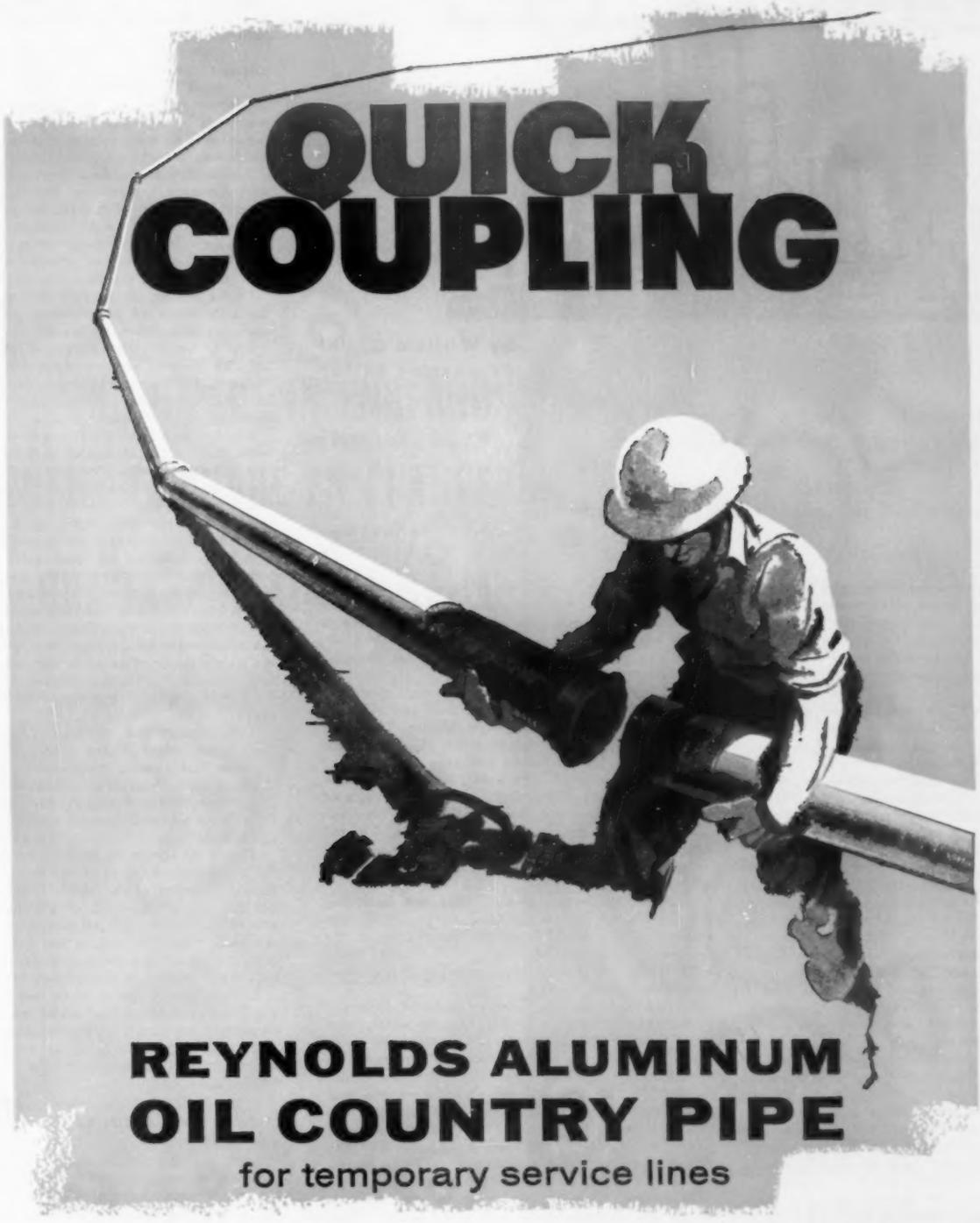

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REYNOLDS ALUMINUM

by William C. Uhl
Processing Editor

Highlights of the month—electric automobiles and solar-powered cars again hit the technical headlines, propane shows promise as a fuel for diesel locomotives, new evidence indicates isoparaffins in motor fuels can be significant contributors to air pollution from exhaust

Methods of vehicle propulsion other than the conventional gasoline-fueled power plant continue to receive attention. During the past several weeks a number of devices have come into the technical news. Some were brand new ideas. Others were relatively old ones, revived because of somewhat different approaches.

Among the several schemes were the use of electricity and of the sun as a source of power. Along somewhat different lines is a scheme for using propane as a fuel for diesel locomotives.

Electric automobiles never did quite catch on, once the advantages of a gasoline automobile were recognized by the motoring public. Slow, with a limited range of travel, they required frequent battery recharging. True, some use of electricity came about in industrial trucks and a few over-the-road vehicles. But by and large, the motorist today demands ready mobility, long distance cruising range, economic and easily obtainable fuel, and all the other attributes he finds readily attainable in a conventional automobile.

Electrically driven cars, however, still had a few friends, engineers who saw in them a number of peculiar advantages. The engines have very long service life; they need no special cooling system. And for short, daily use at relatively low speeds with considerable stop-and-go driving, they do hold certain attractions. For one example, in a fairly limited, luxury type of market, the electric-powered golf cart has grown quite popular.

This popularity of the golf cart, in fact, plus the findings of a survey which indicated that the average second car in a USA family is driven only 24 miles per day, gave two men the idea of reviving the battery-powered automobile. They are B. L. England, board chairman, Atlantic City Electric Co., and C. Russell Feldman, president, Eureka Williams Corp.

The result of this cooperative venture is the "Henney Kilowatt," an electric automobile that was shown and demonstrated at a meeting of electric industry men in Florida in May. Engineered by Eureka Williams Corp. for its Henney Motor Co. division of Canastota, N. Y., the new Kilowatt utilizes the body of a Renault Dauphine with the rear seat removed to make room for a specially designed control. This device, a stepless type made by General Electric, varies the voltage flowing to the traction-type motor and thus varies the car speed.

The driver has simple switches for turning his motor on or off, and for putting it into forward or reverse. A standard type foot accelerator regulates the controller. Drive is direct from motor through reduction gears to the rear axle. Top speed for the car is 35 mph. There are 36 two-volt batteries supplying power, 18 under the front hood and 18 in the back. In addition, a 12-volt system supplies the lights, turning signals, and windshield wipers.

Cruising range varies from 40 miles/day if the car is run constantly) to 50-60 miles (if run at moderate speed with frequent stops). Batteries regenerate a small amount during stops of 15 minutes or more. They can be recharged fully overnight by plugging into any 110 or 220 volt outlet.

Life expectancy of the batteries is over two years with ordinary good care. Motors should last about 30 years with occasional changes of brushes. The Kilowatt weighs 2,245 lb, including 700 lb of batteries.

The car is frankly aimed primarily at the utility industry and some 76 cars were placed on tentative order in advance of production at a selling price of $3,500 each. England and Feldman's survey estimated that the 258 electric utility companies in the USA could use 10,000 or more of these cars in urban areas, for meter readers, collectors, salesmen, and service personnel.

Considerably further in the future, yet intriguing nonetheless, was another car being shown and demonstrated in New York about the same time as the Kilowatt. This was an old (1912 model) Baker Electric Co. car powered by a panel of 10,240 solar cells mounted on its roof.

Silicon solar cells were invented some six years ago in the Bell Laboratories and have been widely used since then to power accessory equipment on space satellites. This application of these cells to power an automobile was primarily to dramatize the future potential of the devices. Such a car is not practical now because of high initial cost. For example, the solar cell panel for the car, built by International Rectifier Corp. of El Segundo, Calif., cost $15,000, although the company estimates it could be manufactured in large volume for $2,000 to $3,000.

At present, there are a number of other limiting factors too. It requires from 8 to 14 hours of sun light to provide enough electricity to operate the car one hour. The 72-volt battery system in the sun-powered car can also be recharged by plugging into a regular electrical outlet, similar to the Kilowatt. The panel on the top of the car has an area of 26 sq ft.

Perhaps closer to reality is the use of liquefied petroleum gases to power diesel locomotives. According to a recent report by the Southwest Research Institute, San Antonio, Texas, there are design problems, but from present experimental data, the use of LPG in combination with a dual injection system is both economically desirable and technically feasible.

The tests were conducted by the Institute for the Southern Pacific Railway as part of the railroad's overall fuel research program. Both natural gasoline and propane were investigated as to commercial feasibility. Natural gasoline was found uneconomic; its price today is near that of regular diesel fuel and about equal when transportation costs are added.

Propane on the other hand costs about half, or less than half, the price of diesel fuel. And it is abundant in such areas as Texas and Louisiana.

In the tests, propane was injected in the liquid state; previous investigations with vapor phase propane had shown difficult detonation problems and a limited output of power.

A number of mixtures of 63-cetane diesel fuel and propane at various ratios were tried, the final being 25% diesel fuel and 75% propane. A two-cylinder laboratory version of the locomotive diesel engine was used, modified as to compression ratio. Special cam-driven injection pumps supplied liquid propane, which was ignited by a pilot charge of the diesel fuel.

Preliminary results have been encouraging, Southwest Research reports, and the laboratory plans to expand its research with assistance of other interested groups. Also, much work must be done on safety regulations covering the use of propane. The Institute feels, however, that propane may play a very important part in the future of the railroads.

Olefin content of the fuel may not necessarily be the only cause of atmospheric pollution-producing materials in automotive exhaust.

Studies by the USA Bureau of Mines reported at the 25th Midyear Meeting of the American Petroleum Institute's Division of Refining in Detroit in May brought out some interesting and valuable new information on the causes of smog.

The key finding in the Bureau's study was that the isoparaffins in the fuel appear to contribute significantly to the production of olefins in the exhaust. Furthermore, the combustion conditions significantly affect the role of fuel composition in exhaust emissions.

Ever since the 1952 report by A. J. Haagen-Smit and others that certain of the hydrocarbons emitted in automotive exhausts are more active than others in forming smog, investigators have sought to determine the source of the particularly troublesome components. It has been suggested that the fuel composition has a direct bearing on the exhaust composition and that materials regarded as especially potent smog producers should be eliminated from automotive fuel. In fact, about a year ago, legislation was passed on the USA West Coast limiting the olefin content of motor fuels.

This concept was vigorously challenged, and experimental evidence began to be produced purporting to show that exhaust composition is independent of the fuel used. Analytical techniques, however, were not precise enough during the earlier investigations to help detect subtle differences which later were shown quite important.

Results of the more recent research, reported by R. W. Hurn and others of the Bartlesville Petroleum Research Center of the Mines Bureau, show that in general, the composition of the hydrocarbon component of exhaust produced during engine *deceleration* is closely related to that of the ingested fuel. However, during power-producing engine cycles—acceleration and cruise—a more complex relationship exists:

1. Emissions of olefins in the exhaust are substantially independent of fuel olefin when the aromatic content of the fuel is held constant.

2. With olefin content of the fuel unchanged, an increase in fuel paraffinicity results in increased olefin emissions.

3. Aromaticity of the exhaust follows aromaticity of the fuel, as is also the case during the deceleration cycle.

Thus, during a portion of the average driving cycle, the emission characteristics follow fuel character closely; for the remainder of the cycle only the aromaticity of the emissions remains closely identified with the fuel.

The research was financed by the USA Public Health Service as part of its general study of air pollution. Many of the advanced analytical techniques used in the work were the direct result of research on exhaust analysis sponsored by the Coordinating Research Council, Inc. and conducted at the Bartlesville Center.

What's New in Processing Plants

Mobil Oil Co. will complete a new 20,000 b/d delayed coking unit at its Beaumont, Texas, refinery in the spring of 1961. This is the third large coker to be started or completed by Mobil during the past two years; others are Paulsboro, N. J., and Torrance, Calif.

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Signal Oil and Gas Co. is rebuilding the former Hancock Oil Co. refinery at Signal Hill, Calif., partly

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destroyed by fire two years ago. On completion at the end of 1960, the plant will have a capacity of 15,000 to 20,000 b/d, but can be expanded later to 50,000 b/d if desired.

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Ruhrchemie A.G. has completed a combination UOP Unifining-Platforming unit at Oberhausen-Holten, West Germany, with a capacity of 2,000 b/sd Platformate, 2,900 b/sd Unifining, and 900 b/sd light gasoline treating.

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Petrofina Canadian Ltd. will erect an asphalt unit at its Pointe-aux-Trembles refinery, Montreal, Que.

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The application by Petroleos de Galicia to build a 26,000 b/d refinery at Vigo, Spain, has been rejected by the Ministry of Industry.

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The regional government of Sicily has authorized S.A. Mediterranea Raffineria Siciliana Petroli to build a new refinery at Milazzo, in the northeast section of the island, with an expected annual capacity of about 2.6 million tons (about 50,000 b/d).

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The Russians are going to build the first refinery in Ethiopia, at the port of Assab in Eritrea, which is now federated with Ethiopia. Capacity of the plant has not been disclosed.

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The 20,000 b/d refinery being built by Foster Wheeler Ltd. for Tidewater's Danish affiliate, Dansk Veedol AS, at Kalundborg will include the following processing units: desalter, atmospheric crude still comprising a naphtha splitter and light straightrun gasoline stabilizer, naphtha hydrodesulfurizer, catalytic reformer, light straightrun gasoline treater, kerosine treater, LPG facilities, chemical facilities, vacuum gas oil desulfurizer, and vacuum still. Contracts for construction of some of the major units have been given to Soc. Fives Penhoet.

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Texaco Trinidad's new $8.5 million, 100,000 b/d refinery at Pointe-a-Pierre went onstream early in April, operating on Safaniya (Middle East) crude. Designed mainly for Middle East oil, the plant can also process Trinidad crude oil.

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Ultramar Co. Ltd. has formed a wholly owned subsidiary, Golden Eagle Refining Co. of Canada Ltd., to carry on refining and marketing in eastern Canada, who will build a refinery with a rated capacity of at least 5,000 b/d at St. Johns, Newfoundland, the first refinery in that province. Golden Eagle's projects in Panama and Los Angeles, one a new refinery and the other an expansion, are continuing.

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The Shell group has decided on Pulau Bukom Island as the site for its new 20,000 b/d refinery to be built at Singapore. The island is four miles south of Singapore, where the group already operates the largest storage, blending, and distribution installation in southeast Asia.

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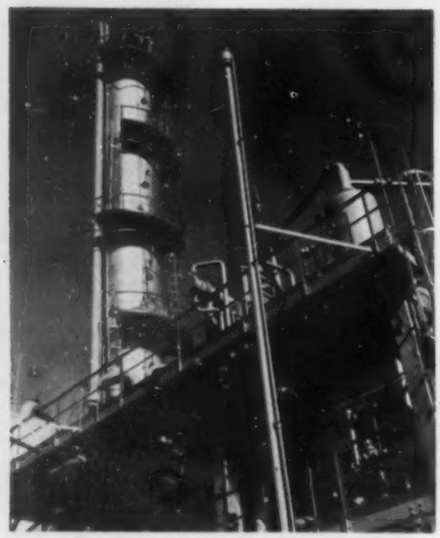

Part of the new 40 million lb/yr polypropylene plant at Humble Oil & Refining Co.'s Baytown refinery.

BP Australia Ltd. will start construction this year on a new £A 8.5 million lube oil plant adjacent its Kwinana refinery, with completion expected in 1963.

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What's New in Petrochemicals

The Borden Co. and United States Rubber Co. are forming a jointly-owned concern, Monochem, Inc., which is starting a $50 million construction program on facilities to produce acetylene and vinyl chloride monomer from natural gas or low flash point liquid hydrocarbon fuels. Several sites have been optioned in Louisiana between Baton Rouge and New Orleans, and in Texas in the Corpus Christi to Houston area. Other locations are also under consideration.

The new plant, on which construction will start later this year, will have an initial capacity of 80 million lb/yr of acetylene and 150 million lb/yr of vinyl chloride monomer. Completion target is 1962. Present plans call for Borden and U. S. Rubber to erect adjacent individually owned plants to use the output of the Monochem plant.

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Goodyear Tire & Rubber Co. will complete about mid-1961 a new "multi-million dollar" plant near Beaumont, Texas, to manufacture two new natural-synthetic rubbers, "Natsyn," made from isoprene, and "Budene," made from butadiene. Capacity was not disclosed. Plant will utilize raw materials obtained from Mobil Oil's Beaumont refinery.

• • •

Humble Oil and Refining Co.'s new $30 million, 40 million lb/yr polypropylene plant at Baytown, Texas (capable of later expansion to 100 million lb/yr as needed) went into operation last month, raising the USA operating capacity for this product to 120 million lb/yr. There are another six polypropylene plants expected to start operations within the coming year which will add an estimated 245 million lb/yr to the USA production.

• • •

Shell Chemical Co. will complete by fall of 1961 two USA plants to produce its man-made equivalent of natural rubber, polyisoprene at a 120 million lb/yr rate. A 40 million lb/yr unit will be on stream at Torrance, Calif. this fall, and an 80 million lb/yr unit will be finished near Wood River, Ill. a year later.

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Ethyl Corp. of Canada Ltd. has awarded a contract for the second phase of construction on an ethyl chloride-ethylene dichloride plant at Corunna (Sarnia), Ontario, to Canadian Badger Co. Ltd. Completion is expected by mid-September.

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H.R.H. Prince Bernhard of the Netherlands officiated at the opening ceremony of the new synthetic rubber plant at the Shell group's Pernis refinery last month in Rotterdam. New plant has a capacity of 60,000 ton/yr of styrene-butadiene type material.

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Kopper Co. Inc. has expanded facilities at Oil City, Penna. to produce a broader range of alkylated phenols.

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Oronite Chemical Co. will spend $3.4 million to construct a new polybutylene unit and expand two existing units at Richmond, Calif. When the new capacity is completed in 1961, Oronite will be the world's largest producer of polybutylene.

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Solar Nitrogen Chemicals Inc., owned equally by Standard Oil Co. (Ohio) and Atlas Powder Co., will complete in 1961 a new $15 million plant near Joplin, Mo. to produce anyhdrous ammonia, urea, and related products. Plant will be operated by Atlas; the products will be marketed by Sohio Chemical Co.

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Humble Oil & Refining Co. will increase butyl rubber production at Baytown, Texas, from the current 125 million to more than 170 million lb/yr by the second quarter of 1961. The company has just completed a 44 million lb/yr expansion at Baton Rouge and anticipates completion of an additional 40 million lb/yr at Baton Rouge by July, 1961. Total butyl capacity will be over 350 million lb/yr when these projects are finished.

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Monsanto Chemicals (Australia) Ltd. and Consolidated Zinc Pty Ltd. of Australia have formed a new jointly owned chemical company, which initially will manufacture fluorocarbons at Monsanto's present Sydney plant by about mid-1961.

• • •

Japan Synthetic Rubber Co. Ltd. has completed its $30 million synthetic rubber plant at Yokkaichi, Japan. Designed by Blaw-Knox Co. Chemical Plants Division, the plant, 25 miles from Nagoya on Ise Bay, will produce 40,000 metric ton/yr of SBR crumb rubber and 5,000 metric ton/yr of synthetic latex.

• • •

Monsanto Chemical Co. and Soc. Industrielle de la Cellulose (SIDAC) S.A., of Belgium, have formed a new company with headquarters in Brussels, and will build a plant at Ghent to manufacture Monsanto's "Saflex" polyvinyl butyral plastic sheets. Completion is planned by 1961.

U.S.A. Gasoline Demand Rises

Total gasoline demand on USA refineries should run at 4,458,000 b/d during second quarter 1960, with production at 4,077,000 b/d, du Pont estimates. Both show gains over the same period last year; demand is 3.6% higher and production about 1% higher.

Domestic demand for aviation gasoline during the second quarter is estimated at 195,000 b/d, down 2,000 b/d from the 1959 rate. Export demands for 1960 second quarter are forecast at 25,000 b/d motor gasoline, compared with 22,000 b/d last year; and 30,000 b/d aviation gasoline, down 33.3% from last year.

New Antiknock Additive Producer

Chatham-Reading Corp. has been formed by Chatham Chemical Corp. and the Philadelphia & Reading Corp. to produce tetraethyl lead and tetramethyl lead at two new projected plants in Beaumont, Texas.

The new firm plans to market an estimated $40 million in gasoline additives yearly through a subsidiary, Houston Chemical Corp. of Beaumont, which will operate the new plants expected to reach completion about the middle of 1961. Houston Chemical, which recently purchased the anti-freeze and automotive chemicals marketing operations of Commercial Solvents Corp., will become the third producer of gasoline additives in the USA.

New Gasoline Additive

Ethyl Corp. has introduced a new preignition control additive for gasoline, a trimethyl phosphate compound tradenamed Ignition Control Compound 4. Ethyl states it is highly effective in controlling such problems as spark plug fouling, surface ignition, and rumble. The company reports that ICC 4 provides more phosphorus per pound of compound than any similar preignition control additive, and that it is available at a lower cost per pound of phosphorus than any comparable additive.

Europeans Inspect New Burners

New advances in burner design for petroleum and chemical processing were revealed to managements of three important European licensees during a recent visit to Selas Corp. of America at Dresher, Penna.

In photograph above, Mr. Ernst Kirchner (third from left), head of Ernst Kirchner, Hamburg, Germany, and Soc. Italiana E. Kirchner, Srl. Milano, Italy; and Mr. F. Peyron (second from right), Soc. Exploitation de Produits Industriels, Paris, France, were present at this first of a series of discussions which will include all licensees in Europe.

Shown with Messrs. Kirchner and Peyron are (from the left): F. O. Hess, Selas president; K. W. Fleischer, vice president, Fluid Processing Div.; W. J. Hofmann, general manager of Selas' European Division, Pregny, Geneva, Switzerland; and J. S. Shute, manager, Export Division.

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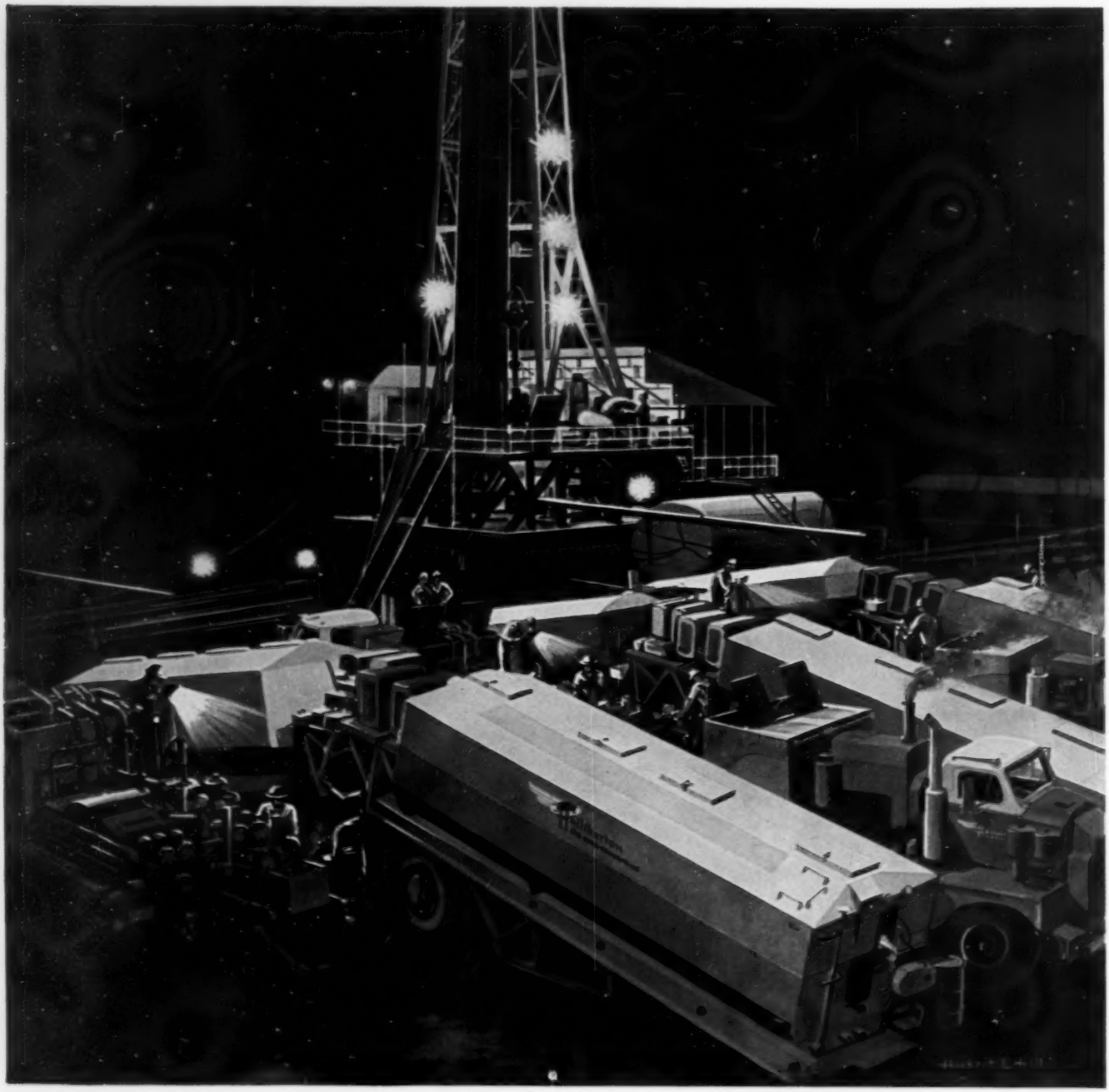

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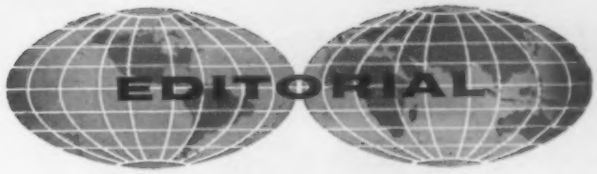


AN EXAMPLE TO THE WORLD

This first Argentine edition of World Petroleum comes on the eve of a first-round victory in Argentina's "Batalla del Petroleo," her battle for oil. As this goes to press, further important contractual arrangements are reported underway by the country's courageous and outspoken economic czar, Minister Alsogaray. They represent another step in the important policy inaugurated by President Frondizi two years ago.

The changes since Argentina abandoned over two decades of restrictions on private international investment in oil are truly enormous. They can best be seen in perspective by comparing the situation today with 1958. In that year the oil situation was threatening indeed. As President Frondizi so ably points out in the following pages, the cost of oil imports was already absorbing 25% of the nation's entire foreign exchange earnings. It was rising constantly, pushed by the nation's stress of rapid modern economic development and within a few years the cost of oil imports would have absorbed most of the country's earnings on international trade. The government oil agency, Yacamientos Petroliferos Fiscales (YPF) struggled long and hard but with the financial resources available to it it could not match the country's accelerating oil use. Private companies were helpless to aid, having been restricted to acreage acquired in the 1920's which had dropped to a very small and high-cost production.

Until 1959 the situation grew more serious each year. Oil consumption, held down by various restrictive measures such as limited imports of automobiles, etc., still continued to rise. Looking ahead, Argentine authorities knew that if controls were ever taken off, as they must eventually be for the economic well-being of the natio dramatic upsurge in oil consumption levels would occur. It would be followed by a leveling-off period, but at still higher plateaux of oil consumption. Obviously, increases in domestic production, transportation, and refining facilities were desperately needed to match the oil appetite of the energy-hungry Argentine nation.

How much effort and investment were (and still are) needed to halt this disastrous imbalance and to bring domestic production and facilities up to the level of oil use? There are various ways of calculating the needed investment. A prominent member of the government's YPF has estimated that the cost of drilling alone, including rehabilitation of wells, to reach required production levels would amount to $750 million. This includes some $450 million necessary for contract drilling payments but it does not include the costs of producing the oil, transporting it to refineries and processing to make it usable to the consumer. All rules of thumb are necessarily inaccurate, however a good indicator is given by the costs encountered by one major U. S. oil company. That company's investment per barrel of oil sold is approximately $4,000. This includes all costs, from exploration through marketing.

On this basis, the cost of lifting Argentine production from the 1959 level of about 122,000 barrels daily to supply in 1964 the country's expected consumption level of 380,000 barrels daily would be slightly over $1 billion.

Compared with this total the investment supplied by the government to its state agency for oil development, YPF, was small indeed. In 1959 the state enterprise was given $29 million for operations including purchases of oil equipment and supplies, plus $19 million additional in credits. In 1958, these funds supplied rose to $40 for operations and purchases and $53.5 million additional in various credits. These amounts do not, of course, include the amounts spent by the Nation for imports of crude and products in those periods. The amounts of money available to YPF in comparison with the investment needed thus indicated the necessity for immediate action to supplement YPF's activities.

Faced with this potentially explosive situation, President Frondizi devised a courageous and ingenious solution. Under a system of unique contracts with YPF, private international capital was admitted to develop Argentina's rich resources. YPF's hands were thus freed to concentrate on increasing production from known producing areas, and as a result its production in 1959 increased by about one-third. YPF for the first time in years has now ceased importing crude petroleum. Imports of products continue, but these too have diminished and may soon disappear. Added to YPF's increased production is that of private companies who have already begun to contribute substantial amounts as their means of transport and number of producing wells increase.

The result of this activity has been an over-all economic resurgence of the great Argentine nation and bettering of the general living standards of the people. Surely that is a worthy example for other nations faced with oil shortages to follow. This Argentine edition is dedicated therefore to the leadership, technical skill and international good will which made this huge international undertaking possible.

Batalla del Petróleo

Dr. Arturo Frondizi
Presidente de la Nacion Argentina

ACEPTO GUSTOSO el requerimiento de "World Petroleum" para explicar brevemente las orientaciones básicas de la política petróleo, del gobierno argentino.

Cuando examinamos las posibles soluciones concretas al problema de nuestro petróleo, lo hicimos convencidos de que alcanzar el autoabastecimiento de ese combustible era una de las condiciones fundamentales para colocar a la Argentina en el camio de un vigoroso impulso de desarrollo.

De ahí que el plan económico que trazáramos para alcanzar este gran objetivo nacional comenzó con la que denominamos "Batalla del Petróleo". Ella está encaminada a explotar una enorme riqueza de nuestro subsuelo para aliviar una sangría que cada año gravitaba más pesadamente sobre la economía argentina.

Algunas cifras ubicarán el problema. En 1940 la producción nacional satisfizo el 61 por ciento del consumo. En 1958 sólo alcanzó a cubrir el 35,6 por ciento, lo cual nos obligó a importar el resto, es decir: 10.350.000 metros cúbicos. La producción nacional en 1958, alcanzó la cifra de 5,7 millones de metros cúbicos.

No obstante los esfuerzos meritorios y sostenidos de Yacimientos Petrolíferos Fiscales, nuestra empresa petrolera estatal, los aumentos de producción no seguían el mismo ritmo que el incremento del consumo..

En una situación de creciente estrangulamiento exterior producido por la falta de divisas, ese aumento en el consumo por encima de la producción significó que en 1958 la importación de petróleo absorbiera casi el 25 por ciento de las divisas del país. En cambio, en 1930 insumía el 8 por ciento.

Nada hacía esperar que en este proceso de sangría se registrara algún alivio en el futuro inmediato. Por el contrario, el crecimiento incesante de la industria argentina debía aumentar constantemente la demanda de combustibles y agravar su déficit. Por ese camino, cada día serían menores las posibilidades de importar máquinas, equipos y productos que el país necesitaba y necesita urgentemente.

El déficit de nuestro balance comercial durante el período 1955-1958 totalizó 1.002 millones de dólares. En ese mismo lapso importamos combustibles por valor de 1.022 millones de dólares. El panorama exigía una acción inmediata apoyada en las posibilidades reales del país. Yacimientos Petrolíferos Fiscales ha cumplido siempre, con los medios que se pusieron a su disposición, una tarea que merece el reconocimiento del pueblo argentino. Pero la situación económico-financiera no permitía destinarle los recursos necesarios para la solución del problema, dentro de los términos perentorios que el país exigía. En el mejor de los casos, recién en tres o cuatro años hubiéra-

mos alcanzado a cubrir la mitad del consumo.

Hubo que tomar, entonces, una gran decisión. Apoyamos decididamente a Yacimientos Petrolíferos Fiscales y complementamos su acción con la actividad de empresas privadas. Con éstas se concertaron dos tipos de contratos con cláusulas que fueron una innovación en las prácticas internacionales: perforación de los pozos por cuenta de Yacimientos Petrolíferos Fiscales y explotación con riesgo a cargo del contratista, que percibe una retribución por el petróleo extraído y entregado a la empresa estatal. Yacimientos Petrolíferos Fiscales, elemento fundamental de nuestra soberanía en materia petrolera, tuvo así el complemento financiero a su capacidad técnica de primera línea.

Bastan pocas cifras para advertir el acierto de esta política. En 1959, Yacimientos Petrolíferos Fiscales incrementó su producción en un 30 por ciento. Para 1960 la producción prevista de petróleo y gas—incluídas las compañías particulares—representará un aumento del 79 por ciento sobre la obtenida en 1959. Se llegará así a una producción de 14,5 millones de metros cúbicos—computando gas equivalente—y sólo será necesario importar 3,1 millones de metros cúbicos, frente a los 10,3 millones importados en 1958.

Podemos afirmar que en 1961 se alcanzará el total autoabastecimiento, lo cual significará:

1°—Ahorro de divisas que podrán ser destinadas a la adquisición de maquinarias, equipos y productos necesarios para el desarrollo económico.

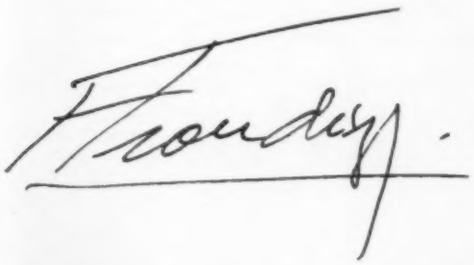
2°—Crear nuevo núcleos sociales de producción y trabajo en diversas zonas del país, de modo de posibilitar la distribución más equilibrada de la población.

3°—Una mayor seguridad en el aprovisionamiento del combustible para la industria y la agricultura, ante cualquier emergencia.

4°—Asegurar nuestra libre determinación en política petrolera.

5°—Desarrollar nuevas industrias, entre ellas las de petroquímica que ya se están instalando y que abren nuevas y positivas perspectivas a nuestras exportaciones.

De tal manera, en 1961, al obtener nuestro autoabastecimiento habremos asegurado de una manera efectiva el desarrollo integral del país, y en consecuencia reafirmado su independencia económica.



Argentina's battle for oil*

by Dr. Arturo Frondizi
President of Argentina

I ACCEPT with much pleasure WORLD PETROLEUM'S request for a brief review of the basic oil policy of the Argentine government.

When we examined the possible solutions to our problem, we became convinced that self-sufficiency in this fuel is fundamental to placing Argentina on the route toward a vigorous policy of industralization.

From this began our entire economic plan, which we have designated a national objective under the heading of "The Battle of Petroleum." It is designed to exploit the enormous wealth of our sub-soil and to alleviate a loss which every year becomes more burdensome to the Argentine economy.

A few figures will show the gravity of the problem. In 1940 national production satisfied 61% national consumption. In 1958 it could supply only 35.6%, and as a result Argentina was obliged to import the rest; some 10,350,000 cubic meters (about 178,644 barrels each day). National production in 1958 had reached only 5.7 million cubic meters (about 100,871 barrels each day).

Despite the worthy and sustained efforts of YPF, our state petroleum enterprise, domestic production did not match the increase in domestic consumption.

In a situation of increasing stringency of foreign products because of the lack of exchange, this increase in oil consumption along with the trend in production, brought about a situation in 1958 wherein the importation of petroleum absorbed almost 25% of the foreign exchange earnings of the country. By way of comparison, in 1938 it absorbed only 8%.

Nothing encouraged us to believe that this trend would reverse itself in the immediate future; on the contrary, the constant increase in Argentine industry caused a corresponding increase in demand for fuel which aggravated the deficit. Every day thus lessened our ability to import machinery, capital goods and the products which the country needed so very urgently.

The deficit on our international balance of trade during the 1955-1958 period totaled 1,002 billion dollars. In this same period we imported fuels with a total value of 1,022 billion dollars. The situation demanded immediate action based upon the real potentialities of the country. Yacimientos Petroliferos Fiscales, using the means put at its disposal, has carried out a task which deserves the commendation and thanks of the Argentine public. However, the economic and financial situation did not permit giving Yacimientos Petroliferos Fiscales the very necessary financial resources for solution of this problem within the time the situation demanded. At best, Yacimientos Petroliferos Fiscales would have been able in two or three years to increase production only enough to cover about half of the country's consumption needs.

It was necessary, therefore, to make a great decision. We supported Yacimientos Petroliferos Fiscales and we complemented its activities with private enterprises. We concluded two types of contracts, each with clauses which were unique in international oil practice; drilling contracts for the account of Yacimientos Petroliferos Fiscales, and exploitation contracts performed at the risk of the contractor who would receive a return based on the petroleum produced and delivered to our state enterprise. Yacimientos Petroliferos Fiscales, the fundamental and basic instrument of our national sovereignty in petroleum affairs, thus received financial aid commensurate with its first class technical capacity.

A few figures suffice to show the wisdom of this policy. In 1959, Yacimientos Petroliferos Fiscales increased its production by 30%. During 1960 the estimated production of oil and gas—including production by private companies—will represent an increase of 79% over 1959 levels. It will thus reach 14.5 million cubic meters (about 250,273 barrels per day)— including gas equivalent—and it will only be necessary to import 3.1 million cubic meters, about 53,500 b/d, compared with 10.3 million cubic meters imported in 1958.

We can affirm that in 1961 we will reach total self-sufficiency in oil, which will mean:

(1) A saving in foreign exhange that can then be used to acquire machinery, equipment and products necessary to our economic development.

(2) Creation of new sources of production and work in various parts of the country, more equitably distributing the population.

(3) A greater security in the supply of fuel for industry and agriculture in the case of any possible emergency.

(4) Assurance of our free determination and sovereignty in oil policy.

(5) Development of new industries, among them the petrochemical industry which is already now growing and the opening of new and exciting prospects for our exports.

In this manner by 1961 we will, in assuring our self sufficiency in petroleum, have assured at the same time the integral development of our country and consequently have reaffirmed its economic independence. END

*Translation of preceding article.

Dr. ARTURO SÁBATO was born in Rojas, Province of Buenos Aires, on September 10, 1913. He received his doctorate in chemistry from the Universidad Nacional de La Plata in 1938 and entered the refinery at La Plata the following year. He continued his career with YPF until 1948 when he became a professor at the University of Cuyo. He later rejoined YPF in 1956 but left again in 1957 to devote his time to private activities related to the oil industry until May 21, 1958, when President Frondizi designated him the President's Representative to YPF.

YPF and Argentina's Oil

by Dr. Arturo Sábato
General Director
Yacimientos Petrolíferos Fiscales

A LITTLE MORE than three years after the beginning of her "Batalla del Petróleo", Argentina has reached self-sufficiency in oil, a goal she has been fighting to achieve for years as a vital part of her economic security and an important factor in solution of her foreign exchange deficit.

Up to February 1960, Yacimientos Petroliferos Fiscales, the state enterprise charged with responsibility for Argentina's oil effort, had satisfied 60% of the fuel needs of its share of Argentina's market, using exclusively YPF's own oil production; beginning with that date, YPF began to also supply private companies operating in the Argentine market.

This was the first stage in the "Batalla del Petróleo," and to accomplish it it was necessary for YPF to produce in 1959 about 30% more oil than was produced in 1958; a direct result of YPF's efforts and an indirect result of the private oil contracts now in force which permitted the state enterprise to concentrate its efforts on production with consequent better results.

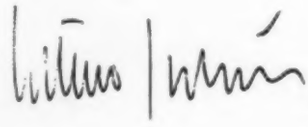
The second stage will presumably be completed sometime in November or December of 1961, when Argentina will become self-sufficient in oil. At that time, the program of Yacimientos Petroliferos Fiscales will call for a daily production of 45,000 cubic meters (283,500 bbls.) of crude; about 25% of this production will be from the two exploitation contracts (Pan American and Banco Loeb) now producing.[1] This production may be higher yet if contract areas of Esso, Shell and Union Oil begin to produce.

These results have been and will be possible thanks to the decisive action of Yacimientos Petroliferos Fiscales in its "Batalla del Petróleo," a prime factor in this essential national development.

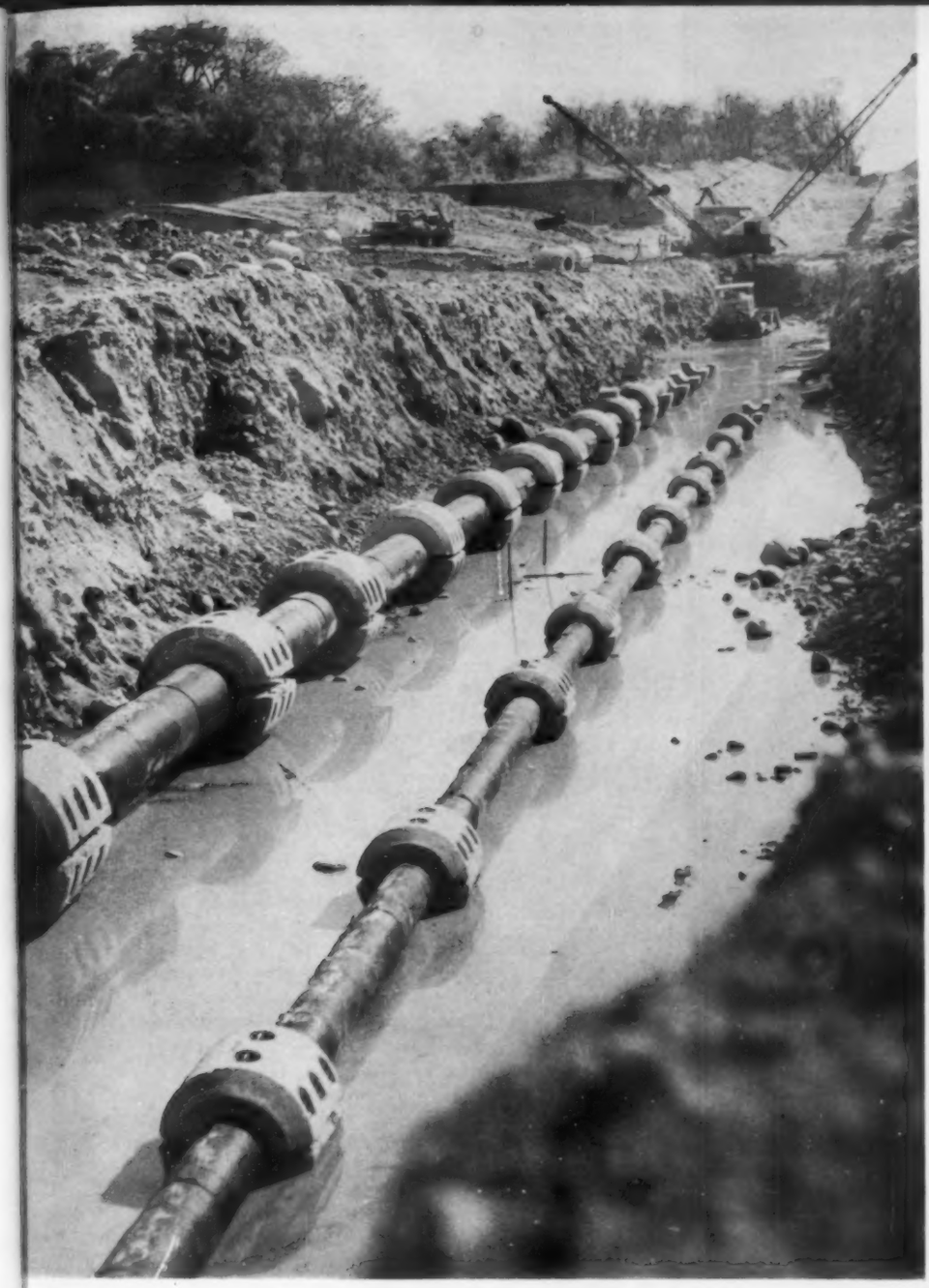
Once self-sufficiency in oil has been reached, the third and last stage in the development of this historic process will begin; the responsibility of maintaining this pace and supplying consumption needs which are constantly growing, as is proper to a country in full development of its great economic potential, following a policy based on the collaboration of government and private capital.

This collaboration, which has already manifested itself in the field of petroleum exploration and production, will broaden in the fields of refining and transportation by pipeline, as demonstrated in the recent agreement for a lubricants line and construction of two plants for catalytic reforming, based on the property and development rights of private entities working under the State enterprise.

I have no doubt that, following the policy designated as our "Batalla del Petróleo," Yacimientos Petroliferos Fiscales will be able to cover satisfactorily the country's needs in this third step, which will mean for Argentina the right of freedom in petroleum affairs.



[1] Production by Tennessee (in Tierra del Fuego area) is very small when compared with the other amounts.



A major contribution to Argentina's energy needs was made by the twin gas and oil lines recently completed from Campo Duran to Buenos Aires. Shown here is the Rio Las Piedras crossing. It required moving some 200,000 yards of gravel to relocate the stream bed and assure safe passage of the twin pipelines. The cement collars are for negative buoyancy.

The national oil future

Within a few years Argentina will become a net exporter of oil, a complete reversal of her position two years ago. Major credit must go to the new oil policy which has made oil a prime mover in the Argentine economy.

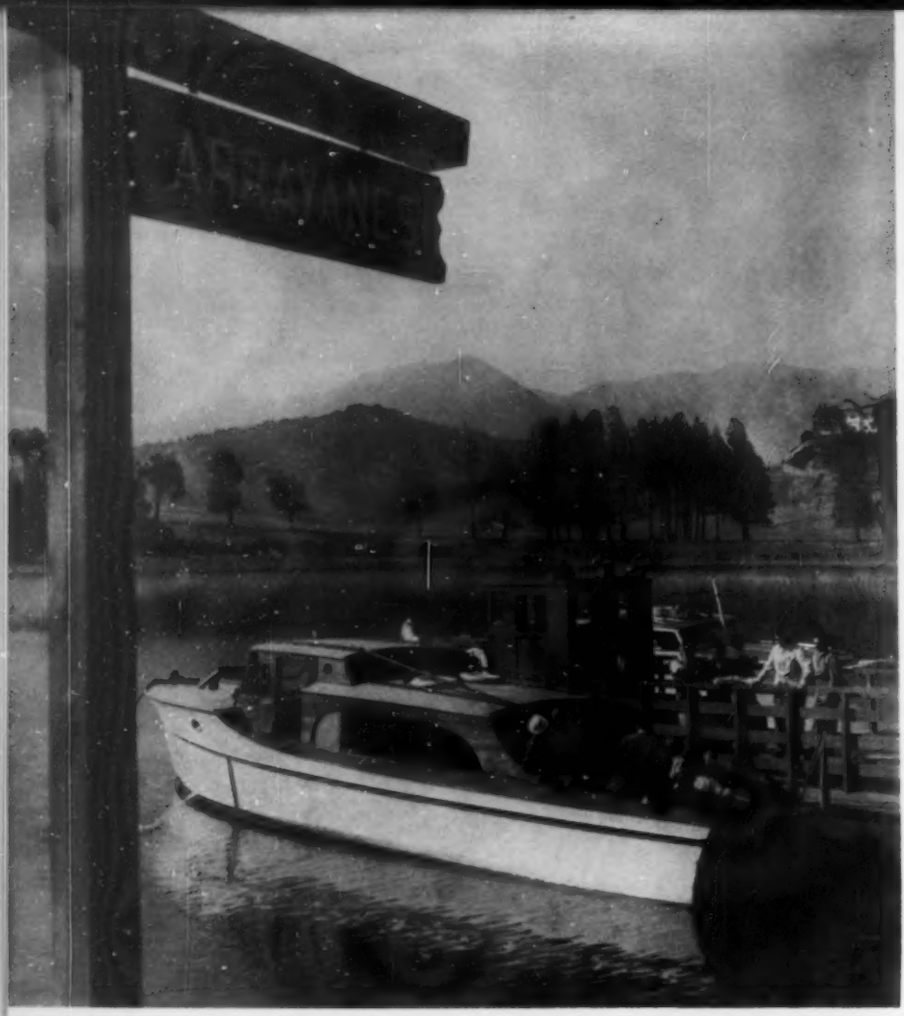
by D. Marcos Soifer

Production Manager
Yacimientos Petroliferos Fiscales

It was the Argentine State, through its Division of Mines, which first discovered oil in Argentina, while drilling for water for the town of Comodoro Rivadavia. The discovery was made on the 13th of December, 1907, 1,500 kilometers southwest of Buenos Aires, on the Atlantic coast.

As in the United States, the establishment of the oil industry antedated the discovery of domestic petroleum, for already in 1905 a primary refinery was in operation at Campana, supplying kerosine for lighting purposes from imported raw material.

The Argentine oil industry was born, therefore, at the beginning of the Twentieth Century, and for more than fifty years its growth and development have kept pace with world progress in this field.



A land of great contrast and beauty. Here is a scene from Bariloche, one of the world's most scenic areas covered with lakes and noted for its fishing. (Photo supplied courtesy of Transcontinental Air Lines, Buenos Aires)

Government initiative in oil exploitation, which led to the establishment of Yacimientos Petroliferos Fiscales (YPF), was supplemented in 1916 by private activity. New discoveries led to the exploitation of the deposits of Plaza Huincul, Salta and Mendoza.

As regards refining, YPF introduced it to Argentina in 1914 with its refinery at Comodoro Rivadavia. The Argentine oil industry in both its primary and auxiliary phases, has been developed by both official and private initiative. Insofar as concerns the actual production of crude oil, the reversion of oil reserves provided for by law of 1935 and recently approved as legal regulation for the oil industry, restricts the activities of the private concessionary companies, whose production of petroleum is gradually declining, while they maintain their share in the refining and marketing of products.

Production of Crude

Despite certain accidental declines, YPF has increased its output yearly. From its original 16 cubic meters* in 1907, it rose to 6,454,052 cubic meters in 1959, which is 91.06% of domestic output in that year. The average annual increase was 7.5% during the last ten years until 1958, when it rose 30.0% over the previous year. The total produced by YPF up to the end of 1959 was 82,162,013 cubic meters, which amounts to 70.1% of the cumulative domestic output.

*One Cubic Meter equals 6.29 U.S. barrels.

Private companies stepped up their production to surpass YPF in 1931, reaching an all-time high in 1934 with 1,394,000 cubic meters, equivalent to 62% of the crude oil produced in the country in that year. At that point their decline began. In 1936 they once more dropped behind and in 1959 had an annual production of only 633,340 cubic meters, equivalent to 8.94% of Argentina production.

Their cumulative productions amounts to 34,986,320 cubic meters, equivalent to 29.9% of all oil produced in Argentina through 1959.

The total output of domestic crude oil in the 1907/1959 period was 117,148,333 cubic meters.

Refining Development

Development of Argentine refining from that modest installation at Campana to the present day is a long story. Up to 1925, only 25% of the crude oil produced was processed, the rest being consumed in its natural state. In 1926, YPF put its La Plata refinery into operation, and thereafter both YPF and private companies built new refineries and modernized those already in operation, increasing the volume, variety and quality of products, and reducing refining costs.

By 1959, a refining capacity of roughly, 13,000,000 cubic meters a year (223,990 b/d) had been reached. This total is increasing, and is expected to pass the 21,000,000 cubic meters (361,830 b/d) mark by 1964. YPF will increase its present 9,000,000 cubic meters to nearly 14,000,000 cubic meters (241,220 b/d) while the private companies will raise their present capacity of 5,300,000 cubic meters (91,319 b/d) a year to 8,000,000 cubic meters (137,840 b/d).

TABLE I

ARGENTINE FUEL USE—1959

(In Metric Tons of Oil Equivalent of 10,500 cal/kg.)

		Per Cent of Total
Solid Mineral Fuels	1,037,561	
Coke	14,356	
Total solid mineral fuels	1,051,917	5.9
Avgas	93,840	
Motor gasoline	1,706,330	
Kerosine	1,251,632	
Tractor Fuel	208,071	
Gas Oil	863,865	
Diesel Oil	1,569,213	
Fuel Oil	6,969,313	
Petroleum Coke	34,468	
Residual Gas	159,907	
LPGas	97,241	
Total Petroleum Products	12,953,880	72.7
Total Natural Gas	760,132	
Wood	1,395,578	
Charcoal	318,066	
Residues	1,054,445	
Burning Alcohol	39,519	
Total Vegetable Fuels	2,807,608	15.8
Hydro Electricity	232,583	1.3
TOTAL	17,806,131	

Energy Needs

Like every country in the process of development, Argentina has an almost insatiable need for power resulting due to an increasing population, industrialization and a rising standard of living. It also reflects world trends as regards the increasing contribution of petroleum, which, in the past 20 years has increased 50% to 80%. Consumption of other fuels has remained practically constant or diminished, with a proportional decline in their percentage of total consumption.

In 1959, consumption of energy in Argentina amounted to 17,806,131 tons of oil equivalent (using 10,500 cal/kg.) according to the partial figures shown in Table I.

Total petroleum and gas consumption in 1959, including other uses besides production of energy and the consumption of the industry itself, can be estimated in round figures at 16,600,000 cubic meters (104,414,000 barrels) which we shall take as a starting point for later predictions.

The increase in domestic energy consumption, the large contribution of petroleum towards this consumption, and the very slow increase in crude oil production have resulted in a permanent and growing deficit which reached its peak in 1958. In 1930, production and importation stood at 55 and 45% on national use respectively; in 1958 these percentages were 35% and 65%. As a result, where in 1930 oil ac-

counted, in foreign exchange, for 8% of Argentine imports, in 1958 the country invested in fuel almost a quarter of the value of all its purchases abroad.

Fortunately, the situation changed in 1959. That year marks the beginning of a new era, in which firm steps towards self-sufficiency can already be observed. This trend has consolidated in the first few months of 1960, raising high hopes of fulfillment of the ambitious plans laid down. In effect, the former trend was reversed in 1959 and domestic production in that year covered 45% of consumption.

Fuel Imports

While agriculture, through its exports, is the source of more than 90% of foreign exchange, fuel accounts for about 25% of imports by value.

Imports of crude oil and its derivatives rose from 5,900,000 cubic meters in 1950 to 10,200,000 cubic meters (64,158,000 barrels) in 1958. The cost in foreign exchange increased from $128 million in 1950 to US $294 million in 1957. It dropped in 1958 to US $196 million, not because of a reduction in the volume of oil imported but because the price of crude oil declined following the end of the Suez Canal crisis.

In 1959, total crude oil and product imports declined to 8,700,000 cubic meters (149,901 b/d) and Argentina invested only US $174 million in purchases of oil products abroad. It is clear that Argentina is entering a new and important stage in its exploitation of liquid hydrocarbons and gas will begin to play a large role as a result of its availability in the great centers of population.

New Oil Policy

In 1958, the constitutional government carried out an inventory. It found that, besides a constantly increasing oil deficit, there existed a similar situation in regard to other sources of energy, roads, railways, steel production, agricultural and industrial machinery, etc. In a word the de-capitalization of the country is forcing it inexorably towards ever more unfavorable international trade balances and offers no hope of rehabilitation, for the sources of foreign exchange have been exhausted or heavily depleted in a vicious circle.

Proven reserves of more than 500,000,000 cubic meters (about 3.75 billion barrels) easily cover total consumption up to 1980 and they are constantly being increased as a result of new exploration. With the purchase of fuels absorbing 25% of all imports, it was clear that a new oil policy had to be applied to achieve self-sufficiency. The most costly course the country can follow is not to exploit its oil. The State, through its agent, YPF, decided therefore to overcome this negative factor by means of a revitalization of YPF itself and an appeal to the private companies, both domestic and international, to work with YPF without the latter giving up its directive and supervisory powers, which is to say: "without having recourse to concessions or renunciation by the State of its control over our oil wealth."

This decision has given rise to interminable controversy. We believe that this debate, inspired by nationalistic convictions which must be respected and also by subordinate considerations of domestic and international policy, is practically closed. Even if it were not, we should not embark on fruitless discussions, for the facts are far above hairsplitting.

It is sufficient to compare the 1959 figures for production and importation with those of 1958, and then predict, on these firm foundations, the future energy situation.

We have said that oil production amounted to 7,087,392 cubic meters (44,579,696 barrels) in 1959, which is to say 1,421,123 cubic meters more than in 1958, equivalent to a rise of 25.08%. It should be pointed out, however, with a view to the future, that YPF surpassed its own output for the previous year by 1,400,000 cubic meters which amounts to an extraordinary increase of over 30%.

An eloquent indication is offered by the daily output of YPF. It was 12,841 cubic meters in May 1958, rose to 16,443 cubic meters in December 1958, to 19,904 cubic meters in December 1959 and to 23,264 cubic meters in the month of April this year. This means that it has risen by 10,423 cubic meters in two years, equivalent to 81%.

Imports decreased in volume from 10,200,000 cubic meters to 8,800,000 cubic meters and the outlay in foreign exchange from US $196 million to US $174 million. The differences are of exceptional importance insofar as they represent a change in policy and the effective application of a new concept, whose benefits grow more evident from day to day.

A New Oil Policy

The goal (national self-sufficiency) and the means (revitalization of YPF and collaboration with private companies) has been set. The influence of the concessionary companies with regard to crude oil production having been ruled out, the new policy concerns itself with: a) exploration and development of reserves; b) drilling; c) production and d) industrialization. We shall see also how a new and important factor, gas, appears on the scene as a fuel replacing liquids, especially fuel oil.

Exploration

Reserves of gas and petroleum as estimated by YPF amount to 620,000,000 cubic meters of oil equivalent on 31/12/59. Of this 434,000,000 cubic meters correspond to petroleum and 186,000,000 to gas. There is therefore no immediate problem. On the other hand, exploration carried out by YPF or under contract encourage the belief that reserves will increase considerably during coming years. Even with intensive exploitation, Argentina should reach 1964 with reserves greater than those confirmed to date. This forecast is based on areas to be explored and wells to be drilled, drainage areas, and minimum recovery per hectare. The results obtained by YPF in 1960 tend to confirm this estimate, since 81,000,000 cubic meters of petroleum equivalent may be added to proven reserves.

On the other hand, the large investments made by the companies contracted for exploratory work must also bring results. Some successes have already been achieved, such as those of Esso at Neuquen, Union Oil Co. in the Comodoro Rivadavia area and especially Tennessee in Tierra del Fuego.

TABLE II
DRILLING IN ARGENTINA 1960-1964

	By YPF				By Contract	
Year	Exploitation Wells	Stepout Wells	Exploration Wells	Total Wells	Exploitation Wells	Total Wells
1960	398	124	87	609	284	893
1961	460	167	107	734	710	1,444
1962	458	169	107	734	858	1,592
1963	458	169	107	734	900	1,634
1964	458	169	107	734	900	1,634
TOTALS	2,232	798	515	3,545	3,652	7,197

Drilling

The purchase of 46 modern drilling outfits by the administration, of which 31 have already been put to work, and the drilling contracts on the Flanco Sud, of which 1,800 have already been undertaken, will considerably increase the number of wells. Without taking into account drilling to be carried out by production and exploration contractors, that is to say, counting only the wells drilled by YPF or by contract in the Flanco Sud, where they will be exploited by YPF, it is planned to drill 7,197 wells in the 1960/1964 period, which number is equivalent to the total work carried out in this field by YPF from 1907 to 1959 inclusive.

Table II shows drilling to be carried out in the 1960/1964 period, showing the nature of the project, the year, and by whom it is to be carried out.

Production

Production of crude oil, which amounted in 1959 to 6,454,000 cubic meters (40,595,660 barrels), more than 30% over 1958, is expected to increase this year to 10,147,000 cubic meters, and successively to 14,755,000 cubic meters in 1961, 17,708,000 cubic meters in 1962, 19,570,000 cubic meters in 1963, and 21,387,000 cubic meters in 1964.

These production levels will be obtained by: a) YPF wells drilled with YPF equipment; b) YPF wells drilled under contract and c) by contractors.

There will be no important variations in the future in Mendoza and Plaza Huincul, nor in Salta, which is increasing its contribution of petroleum and gas considerably this year due to installation of the system of oil and gas pipe lines. The most notable increases will be on both flanks of Comodoro Rivadavia, especially in the south, thanks to the intensification of drilling operations, both by YPF and under contract. On the north flank the increase will correspond to Pan American, a contractor which produced something over 100,000 cubic meters (629,000 barrels) in 1959 and plans to reach the 2,000,000 cubic meters (12,580,000 barrels) mark from 1962 on. Of course the bulk of the increase will be on the southern flank of Comodoro Rivadavia, where in 1964 a production of more than 12,000,000 cubic meters is expected. Table III shows in thousands of cubic meters the crude oil production forecasts of YPF for the 1960-1964 period.

The production of natural gas almost stable since the southern gas pipe line was put into operation, is increasing considerably in 1960 with the inauguration of the gas pipe line from Campo Durán. When all works have been carried out and electric and industrial plants have been converted from fuel oil to gas, its total contribution is estimated at 1,800,000 cubic meters oil equivalent in 1960, with the following progressive increases in cubic meters: 2,500,000 in 1961; 3,000,000 in 1962; 3,500,000 in 1963 and 7,100,000 in 1964, when it is expected that gas from C. Rivadavia will be available through a new pipe line.

Production and Consumption Forecasts

On the basis of the data set forth above and taking 1959 consumption as a starting point, to which will be added an increase of 6% a year, we can make predictions for the 1960/64 period as shown in Table IV.

This means that Argentina in 1960 will cut in 1958 its oil deficit in half; that it will accentuate that tendency in 1961, when it should import less than one million cubic meters and, after 1962, it will have a surplus of hydrocarbons. Of course, this forecast is in the nature of a general balance, with crude oil and its derivatives compensating one for the other, so that there may be actual surpluses or deficits in the case of any of them.

According to these figures, we shall have a deficit of 5,800,000 cubic meters (36,482,000 barrels) in the 1960/64 period and a surplus of 10,800,000 cubic meters in the 1962/64 period.

TABLE IV
ARGENTINE CONSUMPTION OF PETROLEUM AND GAS 1960-1964
(Millions of Cubic Meters of Oil Equivalent—YPF Estimates)

	1960	1961	1962	1963	1964	Total
Oil Production by YPF	10.1	14.7	17.7	19.6	21.4	83.5
Contract Areas	0.6	0.6	0.5	0.5	0.5	2.7
Gas	1.8	2.5	3.0	3.5	7.1	17.9
Total Production, Gas and Petroleum	12.5	17.8	21.2	23.6	29.0	104.1
Consumption, Gas and Petroleum	17.6	18.6	19.8	21.0	22.2	99.2
Difference between Production and Consumption	—5.1	—0.8	+1.4	+2.6	+6.8	+4.9

Liquid Fuels Balance

We have seen that gas assumes, after 1960, an important role. Its contribution of 4.8% in 1959 will increase to 10.2% in 1960, to 13.4% in 1961, to 15.1% in 1962, to 16.6% in 1963 and jumps sharply in 1964, when it is expected the gas from the South Flank will be available and when gas output will reach 31.9%, almost a third of liquid and gaseous hydrocarbon consumption in the nation.

This new power factor will affect the over-all picture and to estimate the use of liquid hydrocarbons, we must subtract gas use from total consumption.

Also, we must consider domestic crude oil production and related domestic refining capacity. On the basis of the points set forth above, we obtain the figures in millions of cubic meters which we set forth in Table V with regard to the country's general perspectives in the field of liquid fuels. If estimates in the above table are correct it will mean:

a) Argentina will achieve self-sufficiency in liquid fuels in 1962 but will still have to import 1,500,000 cubic meters of products in 1960 and 4,400,000 cubic meters of crude oil in the 1960/61 period.

b) From 1961, refinery capacity will exceed liquid oil consumption, which will make it possible to process, after 1962, crude oil in excess of national consumption.

c) The increase in crude production will slightly exceed refinery capacity in the 63/64 period.

d) From 1962 on, Argentina will have a surplus of crude oil which it will be able to refine or not. The increase in petroleum production and refining will meet increases in consumption, insofar as can be foreseen.

As regards YPF, it might be added that it has already achieved its self-sufficiency in crude oil and has begun deliveries of crude to private companies, such deliveries will gradually increase until they overtake domestic consumption in 1962. From then on, the petroleum output of YPF will saturate its own refining capacity and supply private refineries to the extent necessary to cover domestic consumption. It will also provide exportable surpluses, the greater part of which could be processed in national refineries before export.

Summing Up

We have described objectively the history, present status and programs of the domestic oil industry, whose future rests mainly on the activities of YPF.

With all due respect to those patriotic officials who sought national self-sufficiency through the sole efforts of the State corporation, an aim which grew steadily more remote as the figures show, we can now offer new results. They are those obtained by the new and courageous oil policy of the National Government. It is rapidly achieving for us our long-standing aspiration, revitalizing YPF and reinforcing its efforts by those of private companies.

It is unnecessary to dwell upon the benefits which have already accrued to the nation and those which will be achieved in the near future. We simply point out that oil is the most important prime mover in the real development of Argentina. END

TABLE III
PRODUCTION FORECASTS FOR ARGENTINA 1960-1964
(YPF Figures—Thousands of Cubic Meters*)

YPF WELLS	1960	1961	1962	1963	1964
C. Rivadavia (F.N.)	1,101	1,037	979	931	888
C. Rivadavia (F.S.)	2,335	3,610	4,300	4,830	5,320
Mendoza	1,582	1,604	1,684	1,754	1,814
Plaza Huincul	995	1,022	1,045	1,065	1,085
Salta	1,286	2,000	2,000	1,900	1,800
Total by YPF	7,299	9,273	10,008	10,480	10,907
Drilling by Contractors for YPF					
C. Rivadavia (F.S.)	495	2,132	3,840	5,480	7,040
Total by YPF	7,794	11,405	13,848	15,960	17,947
CONTRACT AREA DRILLING					
Mendoza (Banco Loeb)	905	1,400	1,660	1,410	1,240
C. Rivadavia (F.N.)					
Pan American	1,368	1,800	2,000	2,000	2,000
Tierra del Fuego (Tennessee)	80	150	200	200	200
Total by contract	2,353	3,350	3,800	3,610	3,440
Total YPF	10,147	14,755	17,708	19,570	21,387

*One cubic meter is equivalent to 6.29 U.S. barrels.

TABLE V
ARGENTINE BALANCE ON LIQUID FUELS 1960-1964
(Millions of Cubic Meters*—YPF Estimates)

	1960	1961	1962	1963	1964
Refining Capacity	14.30	18.50	19.75	19.75	21.65
Consumption of Liquid Hydrocarbons	15.80	16.10	16.80	17.50	18.10
Product Deficit	1.50	—	—	—	—
Crude Production	10.70	15.30	18.20	20.10	21.90
Deficit of Crude vs. Consumption	3.60	0.80	—	—	—
Excess of Crude over Consumption	—	—	1.40	2.60	6.80
Excess of Refining Capacity over Consumption	—	2.40	2.95	2.25	6.55
Excess of Refining Capacity over Crude Production	—	—	1.55	—	—
Excess of Runs of National Crude over Consumption	—	—	1.40	2.24	6.55
Excess of Exportable Crude over Refining Capacity	—	—	—	0.35	0.25

*One cubic meter is equivalent to 6.29 U.S. barrels.

Fuels for a growing country through SARGO pipelines

Pipeline welders work over the 1100-miles of large diameter gas pipeline. Argentine and United States trained welders were employed on the line. This photograph was taken on the Fitzgerald spread—Lumbreras (South) during October 1959.

The twin oil and gas lines from Campo Duran are a major contribution to Argentina's economic development. They represent outstanding examples of sound engineering practice combined with practical economics to add productive capacity and new industry to a resources-rich area.

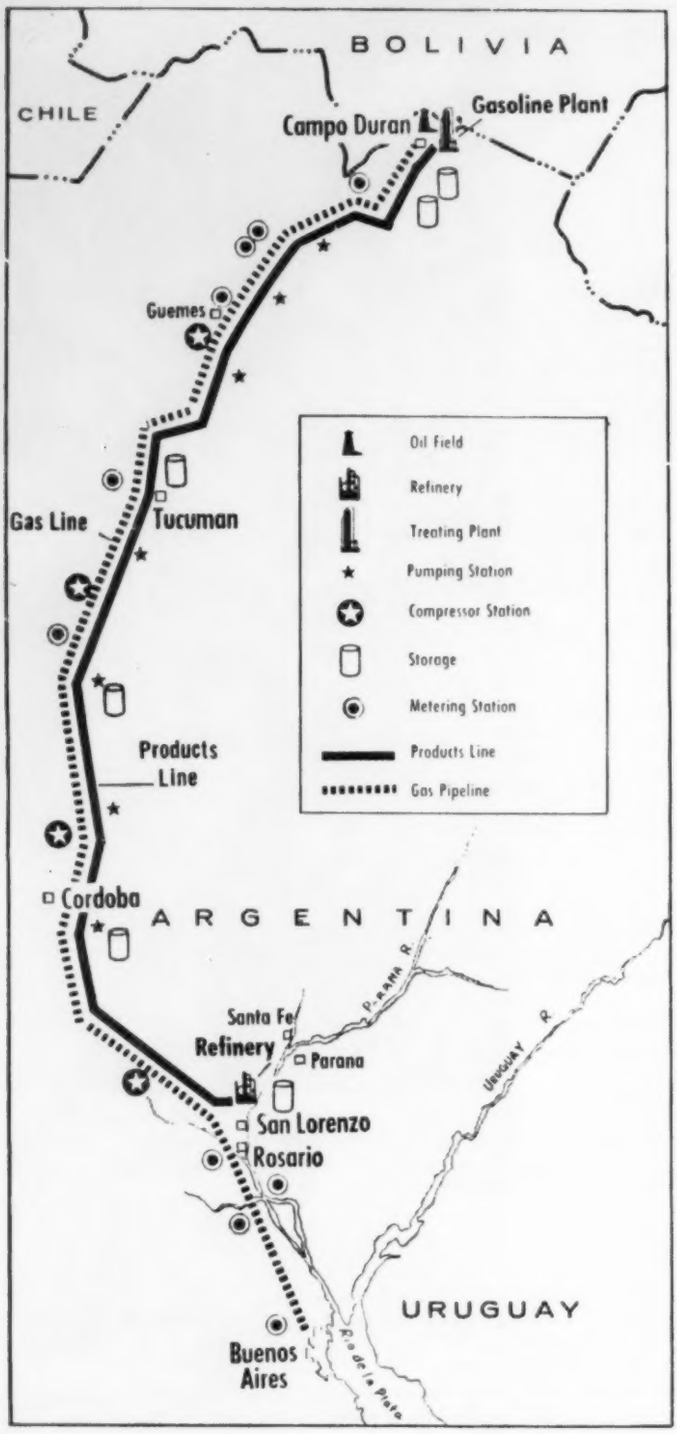
The Campo Duran project in Argentina, now nearing completion for Yacimientos Petroliferos Fiscales (YPF) stands out as a major economic undertaking as well as an engineering task without parallel in South America. The combined facilities represent the biggest pipeline project ever undertaken in South America and probably the largest industrial effort organized in Argentina by an engineering firm. The economic consequences of this phase of the YPF Reactivation Program will be felt by every consumer, both industrial and domestic, throughout Argentina.

The project is unique in that both the 1100-mile 22 and 24-inch gas pipeline and the 900-mile 12-inch products line have been built together as one project. Supply for both pipelines comes from the prolific Madrejones and Campo Duran fields, gathered in a dual pipeline system and processed in a single gasoline plant. The Campo Duran gasoline plant feeds all shipments to both the gas and liquid pipelines, processing seven finished products for delivery to markets along the route of the products pipeline terminating at San Lorenzo, deep water port and refinery center. Large quantities of stabilized distillate are also shipped through the products line for further processing in San Lorenzo.

The economic effects of the new pipelines will be far reaching. With capacity to deliver 243 million cubic feet of gas per day and 57,860 barrels of liquid products per day, a major step will have been completed toward fuels self-sufficiency in Argentina. The Campo Duran project represents an investment of approximately US $200 million in the YPF Reactivation Program.

Constructors

The Campo Duran Pipelines and associated facilities are being engineered and constructed for YPF by International Pipeline Constructors, S.A. (IPCO) who subcontracted various phases of the work to other companies due to the complexity of the operations and the urgent completion schedule. SARGO (S.A. Argentina Obras Oleoductos y Gasoductos) is handling all of the work in Argentina from construction offices in Buenos Aires. Fish International Corporation, Panama, is performing all engineering for the project and is responsible for supervision of construction. Fish staffed



the SARGO organization with the necessary construction and supervisory personnel. These experienced pipeliners and engineers had previously worked with Fish on the Transcontinental Gas Pipe Line and Pacific Northwest Pipeline in the United States.

IPCO subcontracted purchasing functions to NORICAN and NORCANSA for procurement and shipment of all materials and equipment outside of Argentina. SARGO purchased materials in Argentina wherever quality standards could be met and delivery assured. This local purchasing program prompted many Argentine manufacturers and suppliers to expand their facilities and install new equipment. Technical assistance was furnished to many industries which will now be able to provide pipeline and oilfield equipment for future expansion.

Completion

Construction and testing of both pipelines have been completed, with initial deliveries of natural gas and liquid products beginning in March of this year. Construction of the pump stations and compressor stations has proceeded on a priority basis with all facilities on the line during July. The Campo Duran gasoline plant will be completed in August. During the initial operating period, liquids entering the gasoline plant are stabilized for transport to refinery facilities at San Lorenzo. Contractural delivery time for the pipelines is 27 months. Actual installation of the pipelines began in October, 1958, and all pipe was buried 14 months later. Installation was performed in near-record time in spite of heavy rains and delays due to weather.

Logistic Problems

The Campo Duran Pipelines have been engineered following sound and tested methods. As in many other pipeline projects, the design and engineering phases of the work proceed smoothly, with the problems of having the right equipment in the right time and the right place posing the greatest difficulty. In Argentina, the pipelines became a tremendous material handling job, with some 200,000 metric tons of pipe from European manufacturers for the natural gas line and 46,000 tons of plate for the products line for fabrication in Argentina.

Add these staggering quantities to the mountains of parts, engines, special equipment, instruments, trucks, valves, aircraft and supplies to maintain a working force of 2000 men and a clearer picture of the magnitude of the task appears.

Materials from points throughout the world had to begin moving far in advance of construction on the right of way and plant sites. The supply and transportation methods used resembled the logistics used in major military undertakings. Some 20,000 railroad cars were used for overland transport in addition to a large fleet of trucks of every description. Ocean shipment required the charter of 385 vessels, mostly of Argentine registry.

Unusual sources provided much of the equipment, some of which had never produced a pipeline item previously. Materials were moved from one country to another for fabrication to meet the deadlines. The logistic planning for the movement of supply from four continents was the key to successful and orderly completion. This project made it possible for a number of European industries to manufacture new types of American designed equipment under American license and under American know-how. American trained technicians worked closely with the fabricators to insure quality control and to see that requirements were met consistently.

The 12-inch products line was largely rolled in Argentina, using plate shipments from Germany, Austria and Japan. Coordination and assistance in the mill kept an adequate supply for field operations.

C. B. Ames, president of Fish Engineering Corp., who heads the group responsible for design and engineering of plants and stations for the Campo Duran lines.

R. D. Ricketts, president of Fish International Corp. He directed engineering and construction for the mammoth oil and gas project, largest ever undertaken in South America and the largest industrial effort of any kind ever organized in Argentina by an engineering firm.

Ray C. Fish, chairman of the Fish companies, is president of IPCO, the Panamanian firm directing the Campo Duran project. A recognized leader in oil and gas construction, Mr. Fish heads many companies responsible for major gas transmission systems in the United States.

Japanese plate was imported into the United States for fabrication of parts of the 24-inch gas line. However, most of the large diameter pipe was rolled in European mills for ocean delivery to Argentina.

Argentine shipping was used as much as possible with deliveries made to warehousing and storage facilities in Rosario, a deep water port upstream from Buenos Aires on the Rio Parana. From this warehousing and scheduling center, material was transshipped by rail and truck to the job site.

Internal Transport

Although much of the pipeline is served only with narrow gauge railroad equipment, requiring transfer of cargos from broad gauge to narrow gauge at Tucuman, it was advantageous to use the railroad wherever possible. The limitations of the Argentine highway system and shortage of heavy duty trucks limited over the road operations to pipe stringing and hauling to plant sites from railroad unloading points. Roads had to be constructed to many construction sites for access to the pipeline right-of-way. Heavy equipment shipment by railroad required that engineers work closely with the railroad personnel for calculation of stresses and load limitations on bridges and roadbeds. The Belgrano railroad shops constructed several specially built flatcars for transport of the vessels for the Campo Duran gasoline plant.

A fleet of aircraft was in constant use for delivery of supplies, equipment and personnel to the job sites. A courier service was set up for air delivery of mail, drawings and instructions to all construction points from the Buenos Aires engineering and construction office. Each station site maintained a landing strip for these aircraft. A workhorse DC-3 delivered heavy items and food for the construction camps, and usually returned to the home base with equipment in need of repair and personnel working in the engineering departments.

A temporary VHF radio communications system connected each station site and pipeline spread with headquarters in Buenos Aires. Messages could be relayed from the stations to mobile equipment in the field. The SARGO office was in constant touch by TWX teletype with the center of engineering activities in Houston and purchasing in New York. Both lines will ultimately be served with micro-wave communications networks.

Fabrication Shop

Many of the facilities for the compressor stations and pump stations were prefabricated in the project shop in Rosario. Making maximum use of the materials and equipment available, the Rosario shop fabricated many items on a production line basis for delivery to the job site. Automatic welding equipment and complete X-Ray laboratory saved time and materials in the field. The shop also operated an acetylene generating plant and oxygen plant for bottling and shipment to the job, the largest operation of its kind in Argentina. Many similar functions were performed where equipment or skills were in short supply along the pipeline.

Repair parts and supplies were also warehoused in Rosario for quick delivery to the job site. Trucks, tracked vehicles, welding machines and other special pipeline items were repaired and supplied from this point.

Construction Conditions

Campo Duran is located on a semi-tropical plateau near the Bolivian-Argentine border at an elevation of 1,600 feet. The Madrejones and Campo Duran fields are not readily accessible and are cut with deep ravines and heavy timber. The gathering system required extensive clearing and grading of access roads for installation of the 12 and 16-inch main trunks for the natural gas system and the 4, 6 and 8-inch main lines for the liquid gathering lines. Liquid extraction (LTE) units are installed near the wellhead in the gathering system for partial separation of distillate from the natural gas stream and removal of water. The liquid and gas streams are then further processed in the gasoline plant. The high pressure distillate wells in this area have averaged 150 barrels of distillate per million cubic feet of gas produced.

The natural gas and liquid lines are laid on the same right-of-way approximately 50 feet apart. Proceeding south from Campo Duran, the lines cross rough and timbered terrain, skirting the mountain ranges which form part of the Andes chain. At two widely separated points, they reach an elevation of 3,000 feet. Emerging from the foothills and mountain streams which become torrents during the rainy season, the pipelines enter a broad valley near Tucuman and cross farmland largely dedicated to the raising of sugar cane. Wet conditions in this area slowed ditching and field welding operations.

Near Recreo, the line enters an extremely dry and rocky area, with sharp changes in elevation. The ditching machines ordinarily marked the ditch for follow up by back hoes and blasting crews if necessary. The Salinas Grandes, a salt flat formation extending for approximately 60 miles, required considerable blasting. The Cordoba area is extensively cultivated with orchards, vineyards and vegetable crops. From this area the lines gently slope to the San Lorenzo terminal of the products line through wheat fields and grazing land. Some swampy conditions were encountered near

Mud and water faced the pipeliner near Tucuman in the cane field areas. Heavy rains made work all but impossible. This is the Carl Johns Sali Norte river crossing.

the port and river area. The gas line continues on to the city gate of Buenos Aires through pastureland and truck farms.

Natural Gas Line

All pipe in the main gas pipeline is API 5LX with minimum yield strength of 52,000 PSI. Wall thicknesses exceed the requirements of the ASA B 31 Gas Transmission Code, 1955 Edition. Particular attention was given to population indexes in the areas crossed by the line. Line pipe data is summarized below:

LINE PIPE DATA

Length (miles)	Diameter (in.)	Wall Thickness (in.)
75	24	0.344
236	24	0.312
655	24	0.281
134	22	0.250

The pipeline is of all welded construction, tested in accordance with ASA code dealing with gas transmission systems. Both hydrostatic and gas test procedures were used.

For corrosion protection, the pipeline system has been coated and wrapped with one coat of asphalt primer, one 3/32-inch minimum coat of asphalt enamel interwoven with one layer of fiberglass to strengthen the enamel and outer-wrapped with Kraft paper or in some instances asbestos felt. Some areas such as river crossings, Salinas Grandes and other areas where corrosion problems are more predominant, two 3/32-inch coats of asphalt enamel interwoven with two fiberglass wraps are employed. All coating was inspected with holiday detector to establish quality and bond of pipeline coating.

At the present time, corrosion control procedures have been started with the installation of magnesium anodes in the pipeline section crossing the Salinas Grandes area. This section has been insulated from the balance of the system through insulating flanges. A resistivity survey of the whole system will be run after soil conditions can reach equilibrium and complete analysis with recommendations can be made for corrosion control.

Block Valves

Main line block valves are set at 15 to 20-mile intervals throughout the entire route. Valves are Nordstrom full opening type, manually operated except for the gas operated valves at three pressure limiting stations. Pressure limiting stations have a split plunger relief valve installed for set pressures. The relief valve relieves the pipeline slightly below the maximum allowable working pressure of the pipe in the section immediately downstream. It closes when normal operating pressure is resumed.

If the relief valve should fail to close as anticipated, the gas operated valve immediately upstream will close to stop excessive gas loss. These pressure limiting stations are located where pipe of different wall thicknesses join, in accordance with the telescopic line design dictated by YPF.

Compressor Stations

Compressor stations on the Campo Duran system follow time-proved practice on similar transmission systems in the United States. Safety features and operating simplicity generally exceed normal practice in the U.S. Due to the remote locations and supply difficulty, standby units greatly exceed normal U.S. practice.

The four compressor stations on the gas-transmission system have a total of 18 Dujardin-Clark TLA-6 two-cycle compressor units. Each of these is of 2,000-hp. rating at 300 r.p.m. with six vertical in-line power cylinders driving three horizontal double-acting compressor cylinders as an operating unit having a common crankshaft. This engine design uses exhaust gas-driven turbocharger for the dual functions of scavenging and supercharging.

Stations 1 and 3 have five engine units and stations 2 and 4 have four units each. One unit at each station is regarded as a standby unit and will not normally be used in operations. A total of 36,000 horsepower has been installed in the four compressor stations for a designed delivery capacity of 243 million cubic feet of gas per day. Design maximum gas flow and corresponding inlet and discharge pressures for the initial year of operation are shown in the accompanying table.

Electric power at each station is provided by three generator units. Each unit has a four-cycle naturally aspirated spark-ignited gas engine driving a 152-kw. 760-r.p.m., 380-volt, 3-phase, 50-cycle electric generator.

Gasoline Plant

The Campo Duran gasoline plant has an initial daily throughput capacity of 282 million cubic feet of gas per day, extracting 37,000 barrels of products. In addition to seven finished products of propane, butane, gasoline, distillate, kerosene, naptha and fuel oil, the plant stabilizes distillate from wells on the Bolivian side of the producing field for delivery through the pipeline. Fuel oil produced in the plant is used for boiler fuel furnishing processing steam and steam for the power plant. The power plant consists of three turbo electric generators with 2,500-kw. output at 2,300 volts, 3 phase, 50 cycle. Power will be furnished for the adjacent plants and for the project and drilling installations in the Campo Duran area.

Gasoline plant products will be delivered from heart cuts at eight storage and delivery

COMPRESSOR STATION FLOW DATA
INITIAL OPERATING YEAR

Station	Location	Horsepower	Design Flow MCF/D	Inlet Pressure PSI	Outlet Pressure PSI
1	Lumbreras	10,000	242,756	595	994
2	Lavalle	8,000	239,225	570	897
3	Dean Funes	10,000	234,811	514	897
4	Monte Lena	8,000	205,504	533	897

Pipeline spread personnel lived in mobile camps complete with water treatment, sleeping, dining hall and sanitary facilities. The camps could move hundreds of miles within a few days. This is the Carl Johns Cogar Camp, the photograph was taken in October, 1959.

Left: Compressor Station No. 2 at Lavalle is a typical 4-engine station, similar to many stations found on US transmission systems. The Clark compressors were made in Italy. Much of the equipment for the line was purchased in Europe and Argentina.

stations with tank and terminal facilities. Interfaces will be delivered at the San Lorenzo terminal refinery. Most of the distillate and finished products will be delivered to storage at San Lorenzo. Plant products are as follows:

PLANT PRODUCTS

Product	Barrels per day
Propane	4,088
Butane	4,151
Gasoline	7,673
Distillate	34,342
Kerosene	3,113
Gas oil/diesel	4,497
	57,864

Products Pipeline

The products pipeline was specifically designed to move large quantities of finished products from a single source with utmost simplicity. The 900-mile 12-inch system has 18,000 pump horsepower at nine stations with maximum delivery capacity of 57,860 barrels per day. The system is powered entirely by engines.

The entire 900-mile system extends from Campo Duran to San Lorenzo, but only a 750-mile portion of the line south of Tucuman was constructed as part of the Campo Duran project. The north end of the line was built as part of an earlier project.

All line pipe in the Tucuman to San Lorenzo section of the products line meets the API 5LX specifications. It has minimum yield strength of 42,000 psi. Wall thickness is 0.281-in. except at submerged river crossings where heavier pipe was used. Wall thickness was computed in accordance with the ASA Refinery and Oil Transportation Code, 1955 edition. Pipe is all welded; it has been hydrostatically tested to a maximum of 1,400 psi. and in no case below 1,200 psi.

Batching pigs will be run between product tenders. Occasionally, scrapers will be run to improve pipeline efficiency.

Pump Stations

Nine pumping stations are located between Campo Duran and San Lorenzo. Each station has four pumping units, normally three active operating in series with one unit as standby. Operating at peak efficiency, each station will move 2,420 barrels per hour at one thousand pounds station discharge. Pressure load is distributed among the three pump units. Each station is operated semi-automatically from a console in the central control room.

Engines

Pump station engines for all stations are Deutz Model BWV 8M 536 (eight-cylinder, four-stroke) dual-fuel type, designed to operate either on diesel fuel or on a mixture of 90% natural gas and 10% diesel pilot fuel. Due to altitude, two stations are supercharged; the others are naturally aspirated. Engines are water cooled and started on compressed air. Devices provide for automatic shutdown for high jacket-water temperature and low lube-oil pressure.

Should gas pressure drop to 17 psi., the engine will automatically switch over to full diesel operation. Normally these engines will develop 500 b.hp. at 500 R.P.M. capable of 10% overload rating for 1 out of 6 hours operation. Continuous operation may be maintained between 300 and 500 R.P.M.

Pumps are Worthington Model 6 UNBS 13 heavy-duty two-stage pipeline centrifugal pumps with bronze impellers statically and diametrically balanced.

Generating capacity for all station operation is provided at each station. A spare unit is also provided. A relief tank is located at each station.

Control Console

Scam alarm indicators are used in the control console of each station. These indicators show the danger point by illuminating a small pane in the panel indicating the control function. A six-pane alarm panel is provided for each engine with an additional panel of nine panes indicating other station conditions.

A dangerous situation is indicated by sounding of a horn and flashing of a light at the indicating pane. When an audio stop button is depressed, flashing stops at the pane and the horn turns off. The pane remains lighted until the trouble is corrected.

Automatic Pigging

An automatic pig receiving and sending system was devised by Fish engineers to facilitate the use of batching pigs. The sending portion of this system functions by a signal given with a delay equal to the time required for the product stream to pass through the pump-station piping. The delay interval is determined by the time taken by the product to pass through a section of the upstream pipeline, equivalent to the length of the stream pipeline through the station between the two scraper traps.

Precision timing of the automatic pigging system has been utilized to minimize interface contamination.

Major Subcontractors

The natural gas line was built by COGAR, an affiliate of River Construction Corporation of Fort Worth. At the height of pipeline construction, COGAR operated three spreads from complete construction camps located near the right-of-way. These camps were self sufficient in every respect.

TECHINT, an Argentine pipeline contractor, completed the products pipeline. The previous experience of this firm in Argentine operations was invaluable in establishing efficient operations in many locations at the same time.

The Campo Duran system is a tribute to the cooperative efforts of many organizations and men working toward a common goal. The efforts of the customer, the contractors and the suppliers will be rewarded many times over in new fuels for Argentina. END

YPF's Lujan de Cuyo~ Argentina's newest refinery ~an international project

by C. M. Wooley and M. J. Carnesale

Expansion of Argentina's refining falls in the same league of importance as increasing crude production. Both are a part of the same national drive for self-sufficiency in oil and energy

LARGEST CURRENT REFINERY project in Argentina is Yacimientos Petroliferos Fiscales' new 28,300 b/d expansion in Mendoza—a western province next to the Andean frontier that separates Chile and Argentina. Besides being a modern vehicle for industrial expansion in Mendoza, a key growth area, refinery project Lujan de Cuyo is a striking example of YPF's ability to make the most of the financial and technical resources available in the international marketplace.

When construction work is completed late next year, the streamlined Lujan de Cuyo installations at the foothills of the Andes will have tripled their former crude-refining capacity and produce a wider range of quality products. Final products will include both high and low-octane gasolines, kerosines, jet and tractor fuels, fuel oil, liquid petroleum gases, and coke.

The M. W. Kellogg Co., international engineering-procurement-construction firm was the successful bidder on the project, and its offices in New York, as well as the offices of its subsidiaries in London, Paris, and Buenos Aires all participated in executing it.

20% of total materials from Argentina. Kellogg worked with YPF toward a national objective—to utilize current Argentine resources to the maximum, and to speed development of other local sources of supply. Yacimientos Petroliferos Fiscales bought some 20% (dollar value) of Lujan de Cuyo materials in Argentina. Procurement specialists at Kellogg Pan American Corp. (KPA) in Buenos Aires carried out transactions with local Argentinian vendors.

A group of Argentine manufacturing firms will together provide about $1.5 million worth of refinery piping. Other Argentine companies will supply the big steam boilers for the new refinery's power plant, and special water-treating equipment which has been designed to demineralize the mountain-source Mendoza River water to be used in cooling.

KPA procurement men on the scene had kept in touch with Argentine industrial capabilities for many years. They were familiar with the facilities and specialties of all potential suppliers of plant materials, and helped directly in specialized development of those facilities.

In addition to cooperating with many smaller Argentine firms to work to high-standard engineering specifications for refineries, Kellogg issued a license several years ago to a large rolled-steel manufacturer, ASTARSA. ASTARSA is supplying thirty heat exchangers as well as a dozen other vessels for the current project.

International financing. YPF needed a large foreign credit to pay for the balance of materials. Kellogg analyzed the international financial markets and arranged financing in France which met the needs of YPF.

Essentially, the arrangements worked like this: through the joint efforts of Societe Kellogg (Paris); Constructions Metalliques de Provence (CMP)—a leading French

Many Argentines Staff Kellogg's Buenos Aires Operation

About 90% of the employees of Kellogg Pan American Corp., construction contractor for the Lujan de Cuyo refinery expansion, are Argentines. The modern offices of KPAC at Avenida 1363-67, in Buenos Aires, are directed by Argentine Brig. Gen'l (Ret'd) Raúl Barrera, commercial manager, and R. B. Costello, operations manager.

Although the current Lujan de Cuyo expansion is the largest project now underway, Kellogg has worked in Argentina since 1925. Private capital as well as government organizations have utilized Kellogg technical knowledge. At Campana in the Buenos Aires Province, for example, KPAC is now constructing a Model IV catalytic cracking unit for Esso S.A.P.A., a project slated for completion about the same time as the Lujan de Cuyo expansion.

Through the years, Argentine petroleum interests have called for the latest available refining technology. Back in 1925, shortly after the Cross brothers introduced their famous thermal cracking process to the world, Kellogg erected a Cross unit at Argentina's La Plata installations.

La Plata was also the scene—in 1955—for Argentina's first catalytic cracking unit. The facility was engineered and erected by Kellogg and has been in continuous service. Today, KPAC is associated with providing the country with two different varieties of catalytic cracking which both yield high octane products; the Esso Model IV is a special side-by-side design, and the new Orthoflow unit is a vertical design, with reactor and catalyst regenerator part of the same enclosed structure.

Petrochemicals production is already an established industry in Argentina. Several new installations are in the planning stage and great potential is seen for the future. Several years ago, Kellogg built a 10 ton/day toluene extraction unit for the Argentine Ministry of War. It remains the only installation of its kind in South America.

R. B. Costello

Brig. Gen'l (Ret'd) Raúl Barrera

vendor; Compagnie Industrielle et Agricole de Vente a l'Etranger (CIAVE), and other French banking institutions arrangements were developed under which YPF obtained an eight-figure, medium-term credit. Societe Kellogg had full responsibility for prices paid for materials and negotiated payment arrangements with vendors under the terms of the credit. This work required close collaboration with CMP, CIAVE, and many others.

How the financing worked. Acting with and for the key French vendor, Societe Kellogg, shouldered the heavy responsibilities of judging manufacturers' bids and proposals, and seeing to it that each supplier worked within the exacting specifications the project called for. Capabilities of nearly all the scores of French firms who contributed were well-known to Societe Kellogg's capital goods specialists. Many had proved their abilities by past performance in supplying materials for other Kellogg projects in Europe.

As goods were purchased, thoroughly inspected in shops, and routed by Kellogg experts to French ports of shipments, French vendors were reimbursed in francs according to plan.

Agreements signed in Buenos Aires. There were more than a half-dozen agreements—all signed in Buenos Aires by officials of YPF. Financial gears were so synchronized that work began immediately in Europe when the last documents were signed.

Subsequent agreements designated Societe Kellogg responsible for transport of European materials and equipment to Marseilles and other shipping ports. On their arrival in Argentina, Kellogg Pan American Corporation (Buenos Aires) and Yacimientos Petroliferos Fiscales cooperated in clearing materials through customs, and routing them on by rail or truck to the Mendoza construction site.

Some goods from Italy, England, USA. A priority clause was included in the procurement arrangements whereby materials could be bought in other countries when not advantageously available in France. While the large majority of international goods were obtained in France, other sources were tapped. Large compressors were bought in Italy. Special desalting apparatus came from England. A few special instruments and other items came from the United States.

The detailed technical execution of Project Lujan de Cuyo got into full swing at Kellogg International Corp. offices (London)—the center for design engineering. Process and analytical work had been executed in New York. The nearness of KIC, (London) to Societe Kellogg (Paris) was a chief benefit in expediting the flow of design drawings across the channel. A system of excellent communications was established between engineers and procurement men.

YPF had decided on three major refinery units for the Lujan de Cuyo expansion:

(1) A 28,300 b/d crude topping unit which would process indigenous Argentine crude oil piped from fields less than 15 miles from the refinery plot.

(2) An 18,500 b/d delayed coking unit, which could operate as a visbreaker and transform reduced crude oil to either fuel oil or coke, depending on YPF's future market needs.

(3) An 11,000 b/d Orthoflow Fluid catalytic cracking unit with gas recovery—a modern, high-octane fuel maker. In a continuous operation using synthetic catalyst which is regenerated within the unit, the orthoflow "cracks" undesirable long-chain hydrocarbon feeds to desirable shorter-chain hydrocarbons. The latter—debutanized gasoline, light-cycle oil, butane, propane, decanted oil, and some tail gases—are recovered in vessels and towers nearby.

Engineers in London produced, in precise scale, three-dimensional design models of each unit. Making the detailed design models helped smooth project execution in five ways:

General view of process area at YPF's Lujan de Cuyo refinery, about half-way to completion.

(1) They permitted better visualization of the total design.

(2) Construction planning was facilitated. (By a "reading" of the model, construction planners could better visualize lifts and other problems in advance).

(3) YPF managers could interpret the complicated refinery flow more readily by studying the design in the convenient model form.

(4) During construction, as in erecting miles of piping, the color-coded piping lines on the model quickly communicate what goes where. (The models are at the site now.)

(5) When construction is finished, the models will be valuable training aids when Kellogg operators instruct YPF engineers in unit operations.

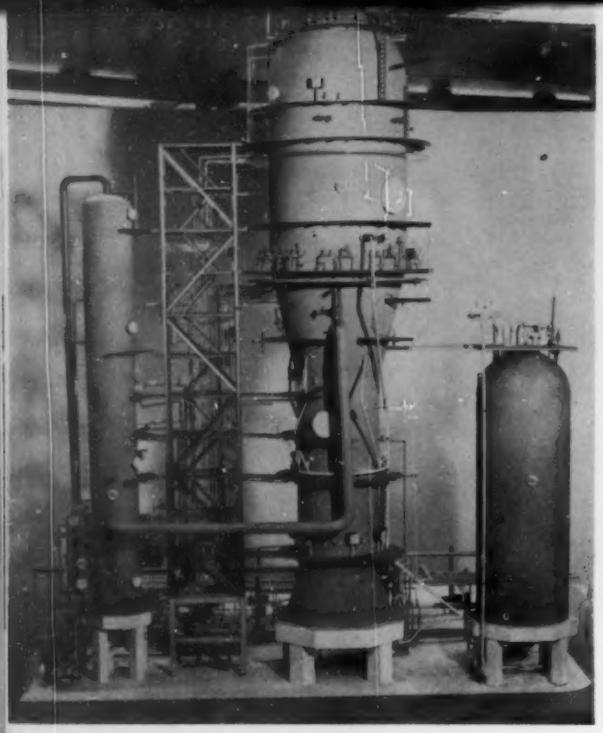
Paris: procurement center. The importance of the Paris procurement operation to the success of YPF's large capital venture can hardly be underestimated. Pur-

C. M. Wooley

C. M. Wooley, recently elected treasurer, M. W. Kellogg Co., has been with the company 40 years; first in engineering and construction, and since 1932, in the financial department. He studied accounting and finance at New York University and mechanical engineering at Newark College of Engineering. Mr. Wooley is a member of the National Association of Accountants, National Association of Credit Management, and International Management Association.

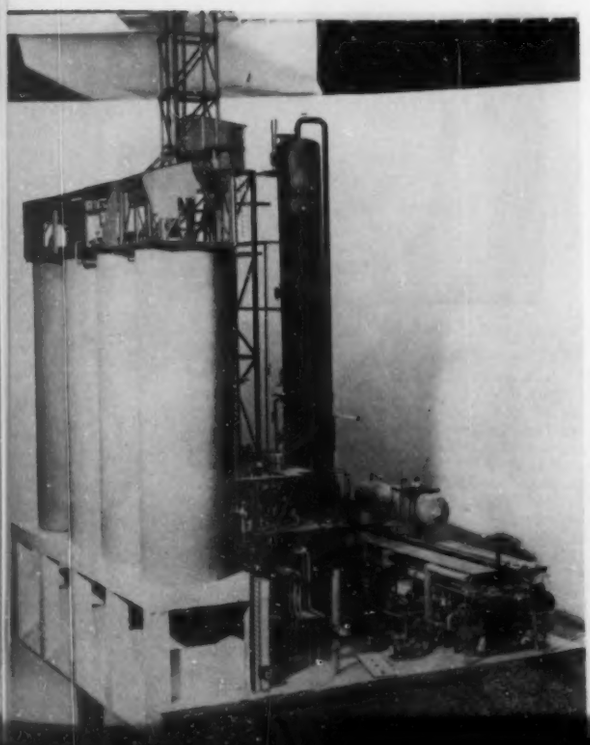
M. J. Carnesale

M. J. Carnesale, assistant vice president—sales, M. W. Kellogg Co., is a chemical engineering graduate of New York University, 1931, and has been with Kellogg since 1944. He was instrumental in the successful adaptation of many war-developed aspects of petroleum processing to specific economic and technical needs of peacetime refining. He now devotes much of his time to work inside and outside the USA, particularly in South America and in Canada.



Model of the 11,000 b/d Orthoflow catalytic cracking unit being built by M. W. Kellogg Co. at Lujan de Cuyo.

French built heat exchangers being loaded into ship at Marseilles for shipment to YPF project at Lujan de Cuyo.



Model of 18,500 b/d delayed coker being erected at Lujan de Cuyo by M. W. Kellogg Co.

chasing highly-specialized materials—many are the one-of-a-kind variety—requires voluminous logistical detail and technical know-how. This was especially true when the destination was another land thousands of miles away.

In purchasing, basing judgments on up-to-date records and personal knowledge of French manufacturing, Societe Kellogg pinpointed the cases where competitive bidding would productively reduce project time or save money. Since shipping dates must be carefully integrated with construction schedules, procurement time factors were especially important.

During manufacturing, SK procurement inspectors made frequent visits to French shops to assure that raw materials and manufacturing processes used would produce finished materials of prescribed quality. Inspectors also individually tested or spot-checked finished items just before they were shipped.

Finally, procurement expediters and traffic specialists worked side-by-side in SK's Paris office to coordinate plans for deliveries and shipments. Transporting large pieces safely, and economically—like sections of a 130 ft long refinery tower—is a tricky problem especially when clearances may be tight along the route or roads to the sea may be narrow or winding. The 130 ft tower was the longest ever shipped by rail in Argentina.

SK procurement planning was successful in lining up deliveries from French plants to match scheduled sailing dates of Argentine freighters. The large majority of YPF's European-procured materials sailed on vessels of the Argentine flag. YPF's payments for overseas shipping thus stayed in Argentine pockets.

Buenos Aires: construction center. Trains and trucks loaded with Lujan de Cuyo materials from three continents have arrived in Mendoza in a steady and organized sequence. As the procurement phase of the project drew to a close, engineering control was centered at Kellogg International Corp. (London). The Buenos Aires offices of Kellogg Pan American Corp. became the hub of construction activity.

The KPA resident construction manager, construction engineers, and several supervisors of crafts arrived in Mendoza Province late in 1959 to take up a two-year residence. They will direct the operation that turns thousands of carefully-made parts into a highly-integrated modern refinery.

Hundreds of intricate piping configurations will be field-fabricated in an assembly-line manner at a field pipe shop. Large storage tanks and vessels with greater than 10 ft diameters will be assembled and welded on site. One vessel to be field-fabricated is alloy-lined. Welds on this lining will require stress-relieving, a special post heat-treating normally performed under the controlled conditions of a manufacturer's shop.

Construction productivity records will be kept on a regular basis by an experienced field office manager and Kellogg's unique construction quality and costs controls will be in effect throughout. KPA plans to employ a labor force of about 700 Argentine artisans.

Scores of Argentine workers, previously inexperienced in specialized welding, pipefitting, rigging, and other construction work are being trained at the site by Kellogg engineers and supervisors. Many Argentine craftsmen, for instance, will learn industrial welding faster with the aid of a special Welding Manual written in Spanish.

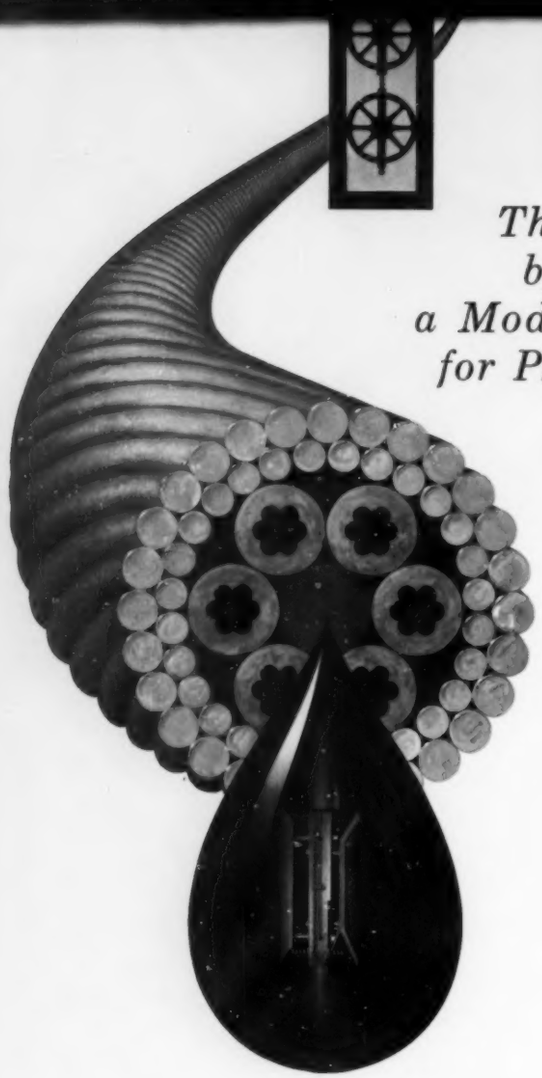
YPF has market alternatives. Yacimientos Petroliferos Fiscales' current outlook indicates that large quantities of fuel oil, gasoline, and coke will have markets in the local Mendoza region—one of Argentina's key growth areas. The city of Mendoza and the metropolitan area about 12 miles north of the refinery have a total population in excess of 250,000.

Another marketing possibility of YPF is the construction of a new products pipeline to carry gasolines and other fuels to heavily-populated coastal communities near Buenos Aires. Distributing products by train or truck are still other possibilities.

In any case, the new Lujan de Cuyo facilities represent another strong stride forward by YPF and the Argentine government in reaching goals of total oil self-sufficiency in products as well as crude production. END

25

YEARS OF SERVICE AND PROGRESS IN ARGENTINA



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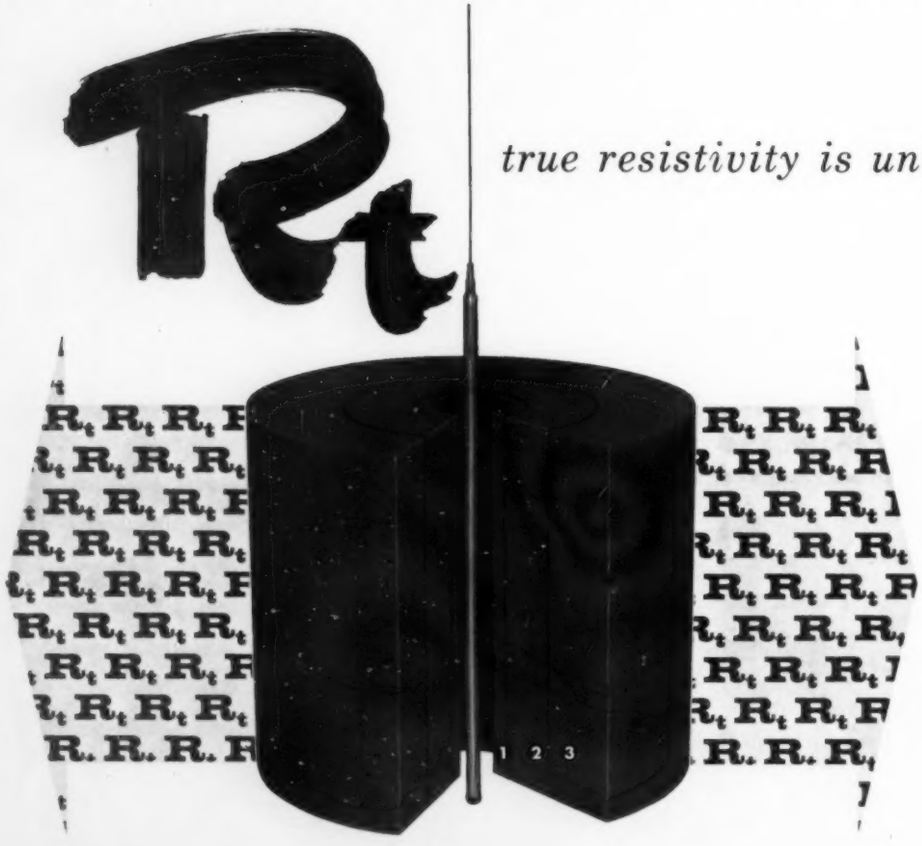

1 *Flushed zone* (R_{xo}) 2 *Invaded zone* (R_i) 3 *Undisturbed zone* (R_t)

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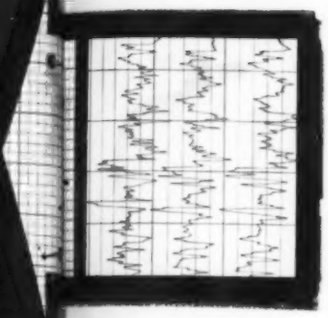

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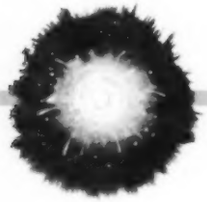

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DEEPEST PENETRATION — plus increased hole size gives 80% more hole volume in standard Berea sandstone flow laboratory target, with a big ½" entrance hole.

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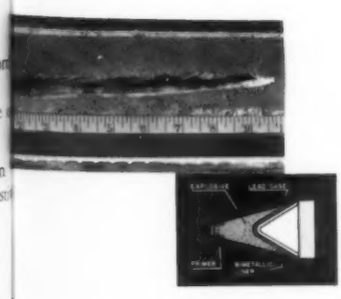


HIGH PRESSURE AND TEMPERATURE RATINGS—Shoots effectively and safely at 20,000 PSI and 350° F.

This is the gun that completes the battery of Schlumberger shaped charge perforators—maximum performance from a 1⅜" tubing gun to this rugged 5" steel carrier. Let your Schlumberger representative help you fit the right gun to the job.

by Schlumberger

THE INDUCTION-ELECTRICAL LOG—*For Oil Saturation*

THE SONIC LOG—*For Reservoir Porosity*

SIDEWALL CORES—*For Visual Evidence*

THE MICROLOG—*For Net Pay Thickness*

THE FORMATION TESTER—*For Final Proof*

These are the services most often used for positive identification of oil in the reservoir. These are the services developed by Schlumberger to make oil finding a logical, orderly, efficient procedure.

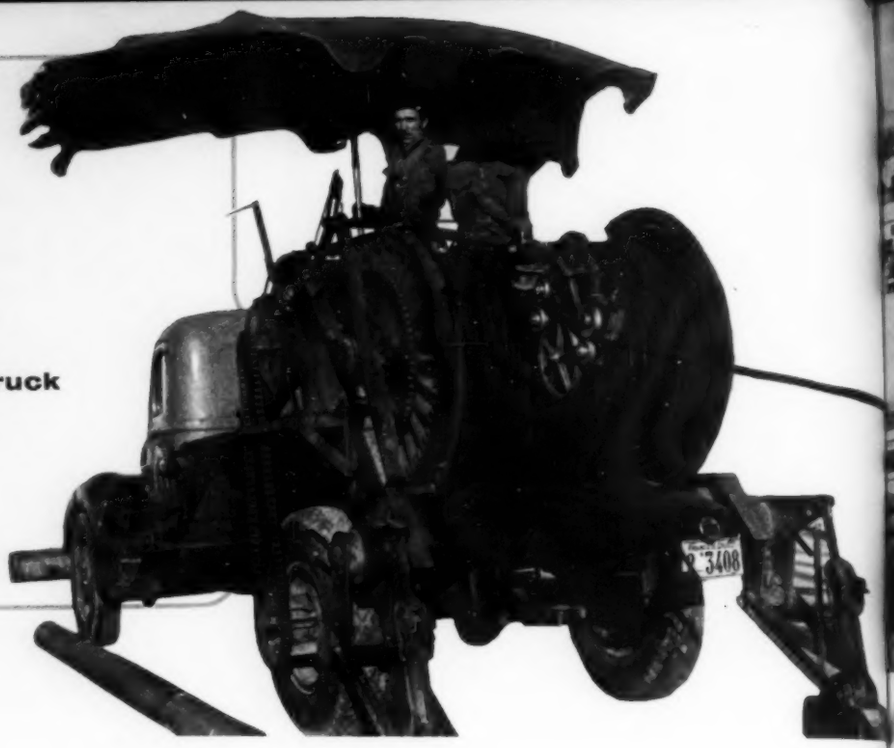
When your investment in a well has mounted from geophysical exploration through drilling to contract depth, sound business calls for the most complete evaluation of all production possibilities. Insure against leaving any oil zone untapped by following this Schlumberger program for oil discovery. Only Schlumberger can give you the combined benefits of the industry's most accurate and dependable tools, and the most experienced field organization in both operation and interpretation.

Ask your Schlumberger engineer to help in planning the logging program on your next well.

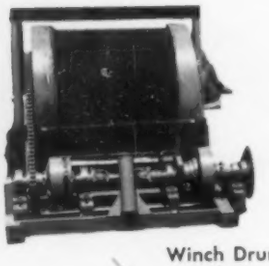
25

YEARS AGO

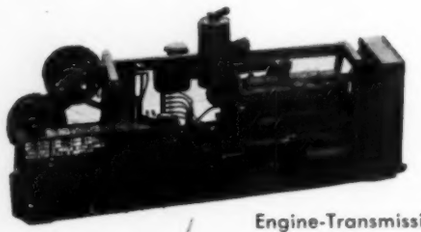
First Electrical Logging Truck



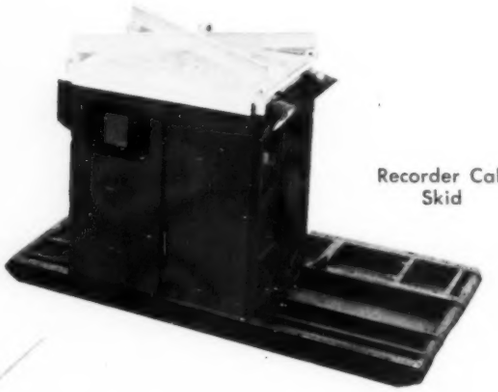
1960 . . . Latest Technical Developments Include Air-Borne Units



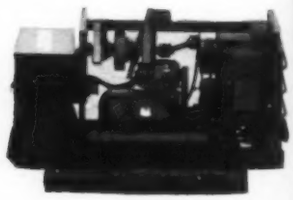
Winch Drum Skid



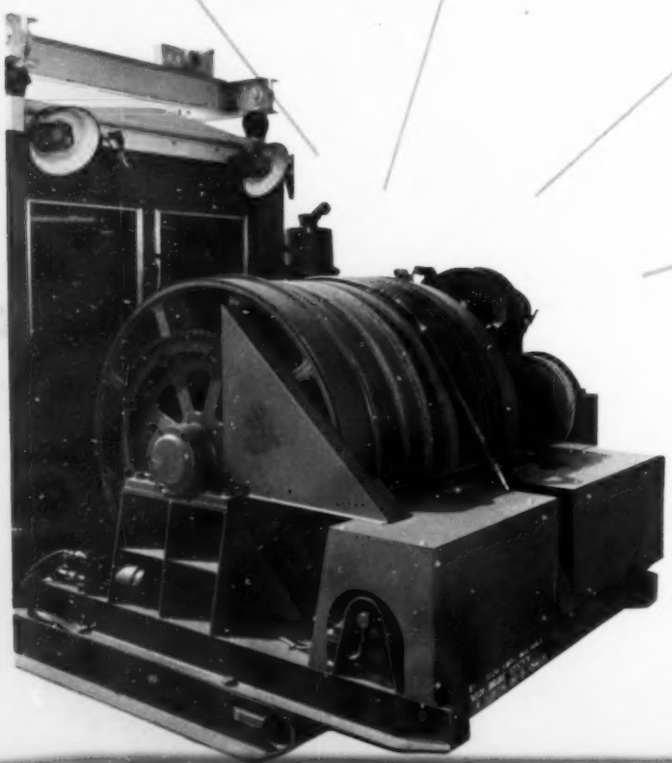
Engine-Transmission Skid



Recorder Cab Skid



Auxiliary Generator Skid



Assembled Helicopter Unit

This Schlumberger Air-borne Unit, capable of performing all Logging and Perforating Operations on an 18000 ft. well, can be transported by Helicopter.

Each component weighs less than 4000 lbs.

SCHLUMBERGER SURENCO, S. A.

Esso is constructing a pipeline to the coast and exploring actively on new acreage. Here is an Esso photo of the company's Huincul Camp in Neuquen Province.

Private companies aid YPF

Private companies have invested many millions of dollars in Argentine oil since 1958. Their operations have enabled YPF to concentrate on increasing production and have contributed substantial new amounts of oil to the country.

THE DRAMATIC EVENTS of the past two years have made 1958 a key year in Argentina's oil history. Prior to 1958, the government maintained a near-monopoly in oil under Yacimientos Petroliferos Fiscales, usually known as YPF. In January 1958 YPF's statutes were basically changed and it was given the rank of an autonomous government department directly responsible to President Frondizi. This meant that YPF could conclude contracts directly with international oil companies, something that it was prevented from doing under its previous statutes.

Pipeline and refinery construction contracts had been signed by 1958 amounting to about $300 million, but most important were a series of self-financing production contracts* beginning in mid-1958 with Pan American International Oil Co. (the international operations subsidiary of Standard Oil Co. (Indiana)); followed in rapid succession by contracts with Carl M. Loeb, Rhoades & Co., a New York stock house with considerable experience in oil; Union Oil Co. of California; Royal Dutch/Shell; Esso SAPA (SONJ affiliate); and Tennessee Gas Transmission. These were followed by a series of drilling contracts, essentially standard payment-by-the-foot type, with Kerr McGee Industries Inc.; Southeastern Drilling Co., and Ente Nazionale Idrocarburi (owned by the Italian government and conducting its Italian operation through SAIPEM, a subsidiary).

Argentina's oil industry has accelerated its development very rapidly under the impetus of these new contracts. There follows a summary of recent developments in oil, followed by separate reviews of the companies operating (excluding Kerr-McGee operations which are covered separately in this issue).

*These contracts have been translated and are contained in a publication entitled *"South America—Basic Oil Laws and Concession Contracts."* Inquiries should be addressed to the publisher, *Petroleum Legislation, Inc., P. O. Box 1591, Grand Central Station, New York 17, N. Y.*

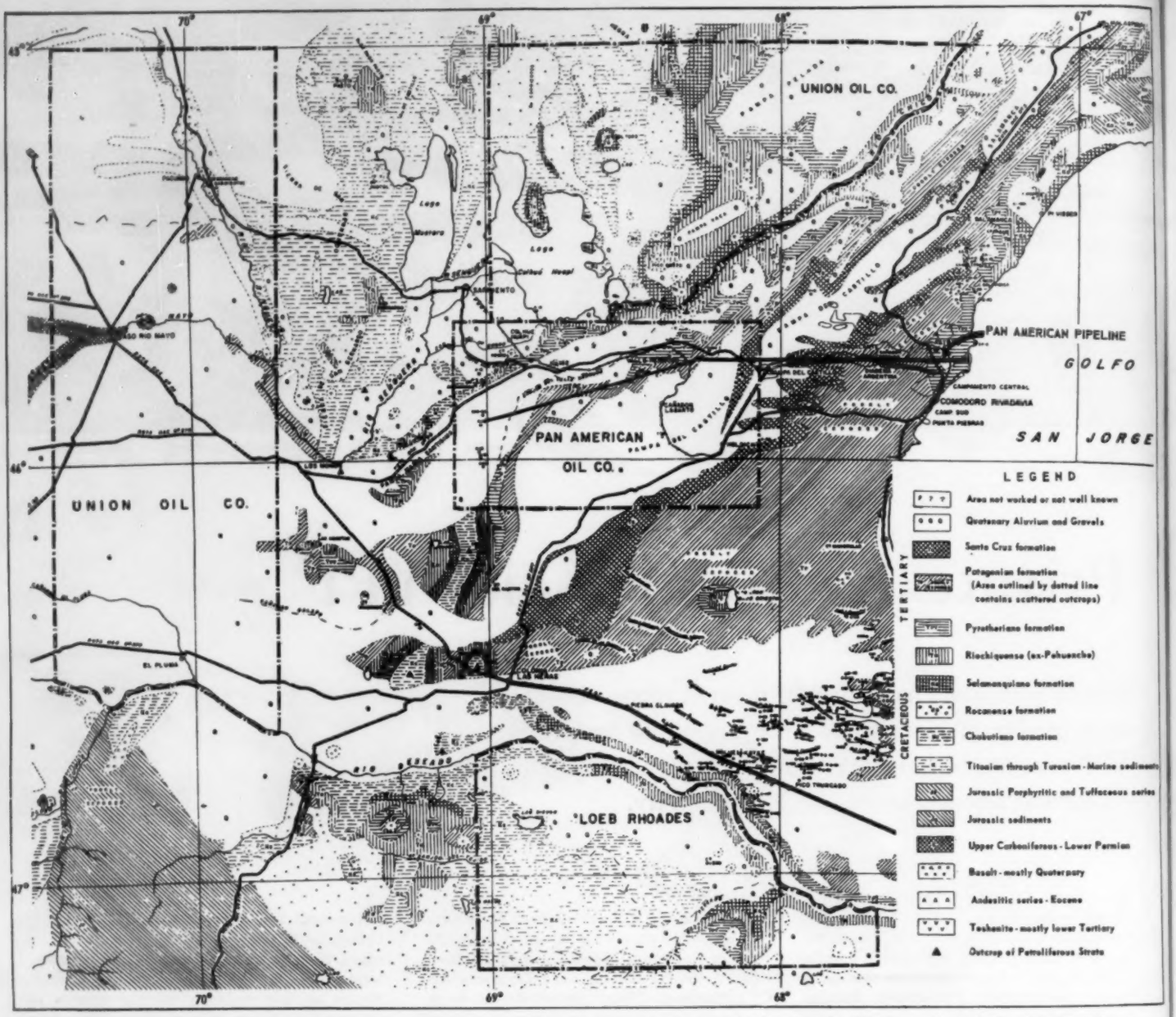
EXPLORATION AND DRILLING

Geological and Geophysical Work: Until recently, only YPF did any exploratory work. Between 1952 and 1957 geophysical activity by YPF averaged about 166 party months per year. In 1958 activity rose to 214 seismic and 36 gravity party months, mainly by YPF. During 1959 the total rose again, but this time the private companies were playing a more important part. Final figures are not available, but the total is estimated at about 423, of which around 10% will be by private companies.

Activities of YPF were at a high level in 1959. Geophysical activities included 23 parties, 20 of them seismic and three gravity, which covered a total of 40,129 sq. km. They included seismic reflection surveys over 13,367 sq. km. and refraction over 3,760 km. Gravity parties covered 17,000 sq. km. and an aeromagnetic survey over the Tierra del Fuego area by the Marine Secretariat covered 5,000 sq. km.

Drilling: In March, 1960, there were 131 rigs operating in Argentina. Of these 45 were being run by private contractors, and 86 by YPF. Completions during 1959 totaled 841 and in 1960 are estimated at 1,523, an increase of 80% over 1959. Projections of drilling by YPF over the next five years are given in accompanying tables.

Production: Argentine production rose 25% in 1959 to 122,837 b/d under YPF's accelerated program. YPF estimates a pro-



Contract areas and geology of the Comodoro Rivadavia area. Note the Pan American Argentina pipeline which was completed in March 1960 to the coast from Pan American's operations. The lower area is under contract to Carl M. Loeb, Rhoades & Co., usually known in Argentina as "El Banco." Kerr-McGee is drilling under contract to El Banco with one rig in this area.

duction of 193,989 b/d in 1960, rising to 373,973 b/d in 1964. This may be high but an increase of 170% to 326,000 b/d by 1964 is believed attainable.

Production during 1959 was 91.1% by YPF. Largest private producer was Diadema (Shell) with 6.1% or about 7,480 b/d. Petroquimica was next with 1.1%, followed by Astra, 1.3% and Esso, 0.4%.

Natural gas production during 1959 rose to about 72.6 billion cubic feet. The recent completion of a major 22 and 24-inch gas line from the north to Buenos Aires will increase deliveries in 1960 greatly.

Producing fields: There are five principal producing areas in Argentina, consisting of Chubut, Santa Cruz, Salta, Neuquén (Plaza Huincul), and Mendoza. Producing fields within these major areas are as follows:

Chubut Fields: Central Zone, Cañadón Perdido, Caleta Córdova, Restinga Alí, Escalante, Manantiales Behr, El Trébol, El Tordillo, Cerro Dragón, Pampa del Castillo, Zona de Sermiento and Punta Piedras.

Santa Cruz Fields: Cañadón Seco, Meseta Espinosa, Cañadón León, Pico Truncado and Tres Lagunas.

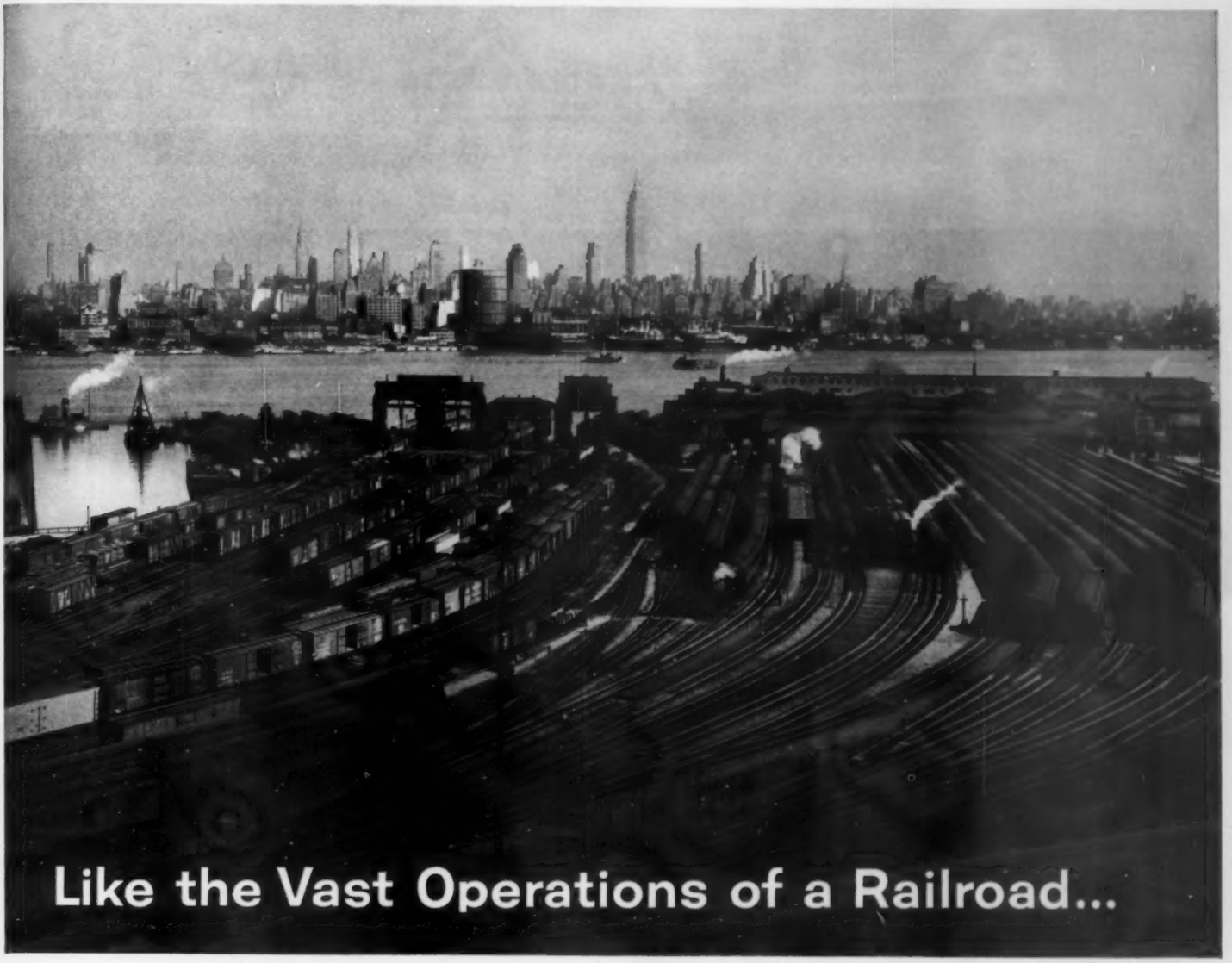
Salta Fields: Tranquitas, Campo Durán, Madrejones and Ex Esso.

Neuquén (Plaza Huincul) Fields: Central, Cutral-Có, Challacó, Del Medio, El Sauce, Aguada Quinchao, Cerro Bandera, Cerro Lotena, San Martín, Barda González, Puesto López, Anticlinal Campamento and N. I.

Mendoza Fields: Tupungato, Tupungato Refugio, Piedras Coloradas, Barrancas, Lunlunta, La Ventana, Estructura Intermedia, Río Tunuyán and Lunlunta Carrizal.

PIPELINES

The 2,200 miles of oil and gas lines in Argentina will nearly double during the coming three years, with 525 miles to be added in 1960, 559 miles in 1961 and 1,025 miles in 1962. Projects are:



there's more to Cities Service than meets the eye!

Railroads cover the country with a complex web of tracks that speed materials and passengers to their destinations. New York is served by 14 different lines ... Chicago by 33 ... Detroit by 10. Railroads have always played a vital part in the growth and prosperity of our cities and towns.

America has 394,804 miles of railroad track serving 412 million passengers and transporting more than 2,500,000,000 tons of freight every year. It takes a complex system of operations and more than one million railroad employees to perform this enormous task.

And it takes modern electric traffic-control systems to dispatch and control traffic in today's busy terminals. But few people realize all that stands behind modern railroad transportation.

Likewise, few motorists pulling into their local Cities Service station to "fill 'er up" think of the vast network of people and facilities behind that tankful of gasolene. It takes drilling crews in five continents, thousands of miles of pipelines, swift super-tankers . . . and Cities Service maintains huge refineries and modern research laboratories to bring the best quality gasolenes to its 18,000 stations.

And it takes investment . . . over a billion dollars so far to build and maintain these modern facilities. Planning for tomorrow, we see an even greater investment.

Only in this way can America have what it needs for progress—more jobs and more and better oil products.

CITIES SERVICE

Left: Pan American has invested over $32 million in little over a year's operations. Shown is one of their drilling rigs at work in Comodoro Rivadavia (photo courtesy Pan American Argentina Oil Co.).

(1) Activation of the new 24 and 22-inch gas line from Campo Durán to Buenos Aires and a 12¾ inch crude products line; (2) A crude line is being built from Plaza Huincul, in the west-central part of Argentina, to Bahia Blanca on the Pacific Coast. The line may later be extended to Mar del Plata. This line is being built by Esso SAPA; (3) A products line from the YPF Lujan de Cuyo refinery to the coast at La Plata. (4) A major natural gas line from Comodoro Rivadavia, in the extreme south, to Buenos Aires. (5) A gas line from Azul to Mar del Plata.

REFINERIES

There are 16 refineries operating in Argentina with a crude capacity of 250,330 b/d. Catalytic cracking capacity is 16,000 b/d, thermal cracking capacity is 73,900 b/d and special processing units are designed to process 50,900 b/d of intermediates.

Two principal expansion programs are in progress under contract with Kellogg Pan American Corp., Buenos Aires. At Lujan de Cuyo YPF is adding 28,000 b/d of new crude capacity, a delayed coker and a fluid catalytic cracker.

Esso is building a fluid catalytic cracking unit at Campana (near Buenos Aires). Tecno-Astar, a local firm, is working with Kellogg and Esso engineers on the project.

Still in the formulative stages are new refineries and expansion by YPF. For other expansion programs see following pages.

Effective operating capacity of present plants is roughly 225,000 barrels per calendar day which compares with a national consumption of about 285,000 b/d of products in 1959. Argentina must more than double its present still capacity during the next five years if self-sufficiency is to be attained. Plants now operating or projected will leave a gap of 170,000 b/d.

DEMAND

YPF estimates the national demand at 15,680,000 cubic meters during 1960 (about 270,211 barrels daily) and 1961 demand at 17,700,000 cubic meters (about 305,022 barrels daily).

YACIMIENTOS PETROLIFEROS FISCALES (YPF)

YPF, a State agency for oil development, is responsible for much of the oil development within Argentina, including private company development by drilling contracts, since these are dependent on YPF for purchase of casing, pumps, and similar auxiliary equipment for wells drilled for YPF's account.

YPF is a fully-integrated company which explores, produces, refines and markets. Operations include approximately 120,000 b/d production, about 86 rigs drilling, six refineries in operation, and a tanker fleet of about 300,000 deadweight tons. Under the name Argentine Government Oil Fields, YPF maintains an office in New York at Rockfeller Center in the Time and Life Building. The manager is Sr. G. Cariglino.

YPF plans to have 121 drilling rigs operating for its account (this includes the drilling contracts but not the production contract rigs of Pan American, Union, Shell, Esso, L & R Development and Tennessee Argentina) during 1961, 119 during 1962 and 148 during 1963. YPF will completely equip 1,344 wells during 1961, expects to equip 1,592 wells during 1962 and 1,634 wells during 1963.

Production by YPF rose to 111,398 b/d during 1959, an increase of about 30% over 1958 levels. The total includes 7,370 b/d for production by private companies under contract to YPF, as follows:

Company	1959 Production *(total barrels)*
L & R Development Ltd.	2,013,537
Pan American Argentina Co.	674,591
Tennessee Argentina S.A.	1,890
	2,690,018

The above figures do not include production by companies holding old concessions. Adding their total, production is estimated at 122,900 b/d for the entire country.

Future Construction by YPF: Storage tanks to be built for oil from the south flank of Comodoro Rivadavia will total 380,000 cubic meters capacity, equal to about 2,394,000 barrels.

YPF plans a pipeline of 14 inches diameter for crude oil, from Challaco to Bahia Blanca, a distance of 625 kilometers (375 miles). Capacity will be approximately 22,600 b/d (3,600 cubic meters daily) in the first stage, with this capacity later to be approximately doubled to 44,000 b/d (7,000 cubic meters daily).

Another pipeline is planned from Mendoza to Buenos Aires, a distance of about

ARGENTINA—REFINING
(Figures expressed in barrels per calendar day)

Company	Refinery Location	Crude Distillation	Cat Cracking	Thermal Cracking	Special Processing	Crude Oil
Y.P.F.	La Plata (Bs. As.)	93,000	16,000	20,000	30,300	91,400
Y.P.F.	S. Lorenzo (Sta. Fe)	22,000	—	6,000	5,000	21,600
Y.P.F.	Lujan de Cuyo (Mendoza)	14,000	—	2,000	6,300	12,400
Y.P.F.	Dock Sud (Bs. As.)	5,500	—	2,700	2,500	5,300
Y.P.F.	Chachapoyas (Salta)	3,000	—	1,200	—	2,900
Y.P.F.	Plaza Huincul (Neuquen)	2,500	—	500	—	2,200
Esso S.A.P.A.	Campana (Bs. As.)	42,000	—	17,500	2,800	35,200
Esso S.A.P.A.	Calvan (Bs. As.)	10,000	—	5,000	—	8,100
Esso S.A.P.A.	M. Elordi (Salta)	1,500	—	—	—	1,100
Esso S.A.P.A.	Dedin (Neuquen)	500	—	—	—	300
Diadema Arg. S.A.	Dock Sud (Bs. As.)	47,000	—	17,000	3,000	37,600
Condor	Avellaneda (Bs. As.)	900	—	—	—	700
La Isaura	Bahia Blanca (Bs. As.)	2,000	—	—	—	1,700
Lottero Papini S.A.	Pineyro (Bs. As.)	900	—	—	—	600
Ragor S.A.I.C.	Quilmes (Bs. As.)	300	—	—	—	300
Petroquimica	C. Rivadavia (Chubut)	5,200	—	2,000	—	3,900
Total Country		250,300	16,000	73,900	50,900	225,300

PRODUCTION OF NATURAL GAS IN ARGENTINA

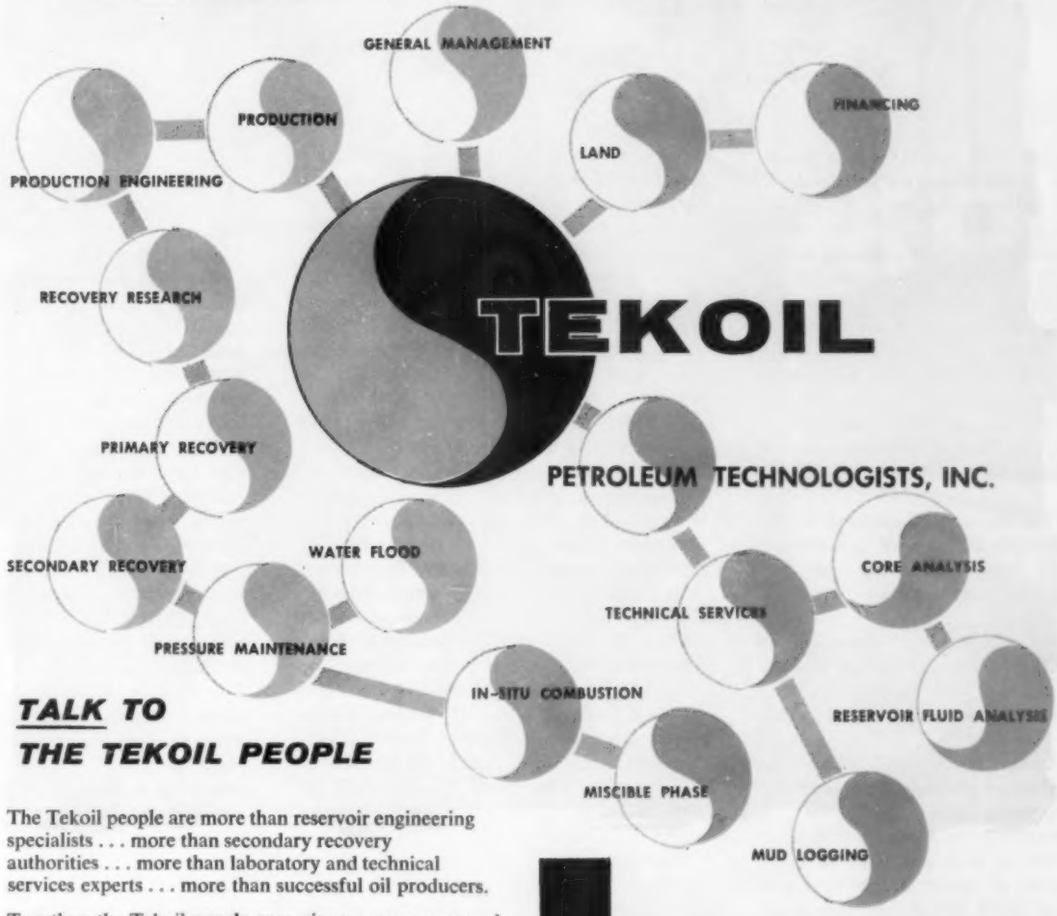
	Cubic Meters	Cubic Feet
1955	1,058,737,000	37,384,003,000
1956	1,147,755,000	40,527,229,000
1957	1,414,289,000	49,938,545,000
1958	1,653,897,000	58,399,103,000
1959 (1)	2,000,000,000	72,620,000,000

(1) Provisional figures.

ARGENTINE TRADE IN PETROLEUM—1955-1959

Imports of Crude Oil	Cubic Meters/Year	Bbls/Day
1955	4,621,398	79,637
1956	4,752,709	81,899
1957	6,698,015	115,422
1958	7,555,317	130,195
1959	5,943,850	102,426
Imports of Products		
1955	3,750,544	64,630
1956	4,345,167	74,877
1957	3,196,314	55,080
1958	2,784,325	47,980
1959	2,807,902	48,386

FOR MAXIMUM ULTIMATE ECONOMIC RECOVERY . . .



TALK TO THE TEKOIL PEOPLE

The Tekoil people are more than reservoir engineering specialists . . . more than secondary recovery authorities . . . more than laboratory and technical services experts . . . more than successful oil producers.

Together, the Tekoil people comprise a success-seasoned, fully integrated organization depended upon by engineers, independent operators — even major oil companies — who want to achieve *maximum* ultimate economic recovery from known reservoirs.

Tekoil's integrated organization will tell you how much oil you have, how to produce it, how long production will last, cost of production, and how much profit you will realize. Then, if you wish, the Tekoil people will handle all or any part of your production problems for you.

The Tekoil people will put their fully integrated organization, their knowledge and know-how that comes from years of successful recovery experience, to work for you.

To achieve maximum ultimate economic recovery from your reservoir, talk to the Tekoil people.

Whatever your needs, Tekoil can tailor a program especially for you. Whether you need a complete recovery program, covering laboratory research, technical services, financing, counsel and operation, or counselling on some special problem, Tekoil can handle the job. The Tekoil people will put their complete integrated organization — or any part of it — to work for you. Every function of every department of Tekoil — whether working for itself or for outside clients — has one aim: MAXIMUM ULTIMATE ECONOMIC RECOVERY. To find out how the Tekoil people can help you, write to any of the Tekoil offices listed below. The Tekoil people will be glad to discuss a program with you, without obligation.

TEKOIL

Executive Offices: Suite 2306, Mercantile National Bank Building, Dallas 1, Texas
General Offices: Tekoil Building, 1515 Classen Boulevard, Oklahoma City 6, Oklahoma
Division Offices: 415 Mid-America Building, Midland, Texas

CORPORATION

PETROLEUM TECHNOLOGISTS, INC. laboratories located at: Buenos Aires, Argentina; Bogota, Colombia; Dallas and Midland, Texas; Montebello and Santa Barbara, Calif.; Rock Springs, Wyoming.

REFINING OF PETROLEUM PRODUCTS
(1959)

	Barrels
Crude Petroleum Processed	47,327,658
Gasoline	8,811,013
Kerosine	4,407,969
Tractor Fuel	665,695
Gas Oil	1,852,845
Diesel Oil	4,418,429
Fuel Oil	23,457,460
Lubricants	516,402
Greases	24,644

EXPLORATION BY PARTY MONTHS—YPF

	1952	1953	1954	1955	1956	1957	1958
Geology	120	88	75	78	29	56	75
Gravity & Magnetometer	36	36	36	36	36	36	36
Reflection Seismograph	96	130	132	132	132	149	214
Total	252	254	243	246	197	241	325

ARGENTINA
PRODUCTION OF PETROLEUM
(1959)

Fields	Barrels	
Comodoro Rivadavia	20,439,901	(1)
Plaza Huincul	6,257,078	
Mendoza	11,131,532	(2)
Salta	2,759,397	
Tierra del Fuego	7,831	(3)
Total	40,595,739	

(1) Production by Contractors to YPF: 673,520
(2) Production by Contractors to YPF: 1,381,450
(3) Production by Contractors to YPF: 1,887

990 kilometers (594 miles) with a diameter of 10¾ inches. Capacity will be about 23,300 b/d initially, and about 40,000 b/d in a later expansion.

YPF Refining Plans: YPF operates six refineries, and has planned considerable expansion in several of them. As of April 1, 1960, YPF projects included the following:

La Plata Refinery: Expansion to 114,600 b/d from 93,000 b/d at present. Units to be added include topping, delayed coking, catalytic cracking, alkylation, polymerization, thermal cracking, visbreaking, vacuum distillation, asphalt treating and lube manufacture.

San Lorenzo Refinery: Expansion to 25,900 b/d through addition of a combined topping and thermal cracking unit, isopropyl alcohol, and catalytic reforming units.

Lujan de Cuyo Refinery: Expansion to about 40,000 b/d through addition of a combined topping and thermal cracking unit, catalytic cracking and delayed coking units.

Campo Duran Refinery: Expansion to 25,900 b/d through addition of topping and catalytic reforming units.

New Lubricating Oil Plant: A new plant for production of lube oils is to be built, with an intake of about 17,200 b/d and production of 2,070 b/d of lube oils in addition to distilled products.

PAN AMERICAN ARGENTINA OIL COMPANY

The first of the new companies to go into Argentina under the new production contract arrangement was Pan American Argentina Oil Co., affiliate of Pan American International Oil Company, 555 Fifth Avenue, New York 17, New York, an affiliate of Standard Oil Co. (Indiana).

Pan American Operations: Pan American Argentina Oil Company signed a contract on July 21, 1958, in order to develop an area approximately 80 kilometers by 50 kilometers lying on the north flank of the San Jorge basin. Pan American Argentina Oil ompany is in charge of all exploration and production of oil and gas within the boundaries of this area and is obligated to deliver the oil to the sea coast. For this Pan American is paid 10 dollars per cubic meter free of any taxes on delivery. By contract it is obligated to drill 50 wells during the first year and 100 wells the second year, and on May 10, 1960, Pan American completed its 150th well. It is also obligated by contract to build a pipeline to be managed by itself from the producing areas within the contract area to Caleta Córdova which lies directly north of Comodoro Rivadavia. This pipeline consists of 69 kilometers of 12¾" from El Chulengo to Cerro Dragón and 71 kilometers of 14" from Cerro Dragón to the coast. The pipeline is now in use (see map) and is delivering oil at Caleta Córdova at the rate of approximately 3,250 cubic meters (20,475 bbls.) per day, but expect to deliver 4,000 cubic meters (25,200 bbls.) shortly when all the rest of the wells are hooked up. The pipeline cost about 6 million dollars.

Since entering the country, Pan American had spent over 32,257,000 dollars as of March 31st.

Pan American has 14 rigs running, 4 of which are considered completion rigs, and has drilled more than 250,000 meters of hole. As of March, 1960 there were 143 wells drilled, 134 completed, 21 temporarily abondoned wells, and 85 wells on production. A number of wells designated "temporarily abandoned" can be drilled deeper and can be made into producers. As of March, 1960, the company had a total of about 5 dry holes and 1 hole junked. Pan American has had to feel its way as the geology of the area is extremely complicated and correlations from well to well are exceedingly difficult. Fresh to brackish water in the formations results in considerable problems with electric log interpretations. The main problem is being able to tell when a sand is saturated with oil. The oil comes from approximately 1500-1800 meters (4,950 to 5,940 feet), the Chubutian formation of upper Cretaceous age. The oil averages 25°-27° API.

There are two principal production and drilling areas. Cerro Dragón wells are 4,250 to 6,500 ft in depth and take from 9 to 15 days to drill. Wells at Anticlinal Grande are drilled to about 3,300 ft and take about 12 days. Logistic problems are severe, especially water supply, which is mostly trucked in. The crude produced is low in sulfur content.

Principal personnel of Pan American in Argentina are as follows: general manager, I. Hayden Hughes; assistant to general manager, E. K. Waering; exploration manager, C. S. Deal; geological supervisor, C. L. Bruce; geophysical supervisor, R. L. Long; chief engineer and production manager, C. C. Fuller. Principal personnel in New York are Christian H. Dohm, president and Wm. Humphrey, executive vice president.

CRUDE PRODUCTION IN ARGENTINA—1959
(In Cubic Meters*)

Company	Comodoro Rivadavia	Plaza Huincul	Del Norte	Mendoza	Tierra del Fuego	Total
Y.P.F.	3,249,530	994,766	438,696	1,769,775	1,245	6,454,012 (1)
Esso	—	15,943	7,627	—	—	23,570
Diadema	436,134	—	—	—	—	438,134
Astra	94,238	—	—	—	—	94,238
Petroquinica	78,785	—	—	—	—	78,785
El Sosneado	—	—	—	513	—	613
TOTAL	3,858,687	1,010,709	446,323	1,770,388	1,245	7,087,352

(1) Includes 326,918 M^3 produced by contractors. *One Cubic Meter equals 6.29 barrels. Source: Argentine Fuels and Energy Adm.

CRUDE IMPORTS INTO ARGENTINA—1959
(In Cubic Meters*)

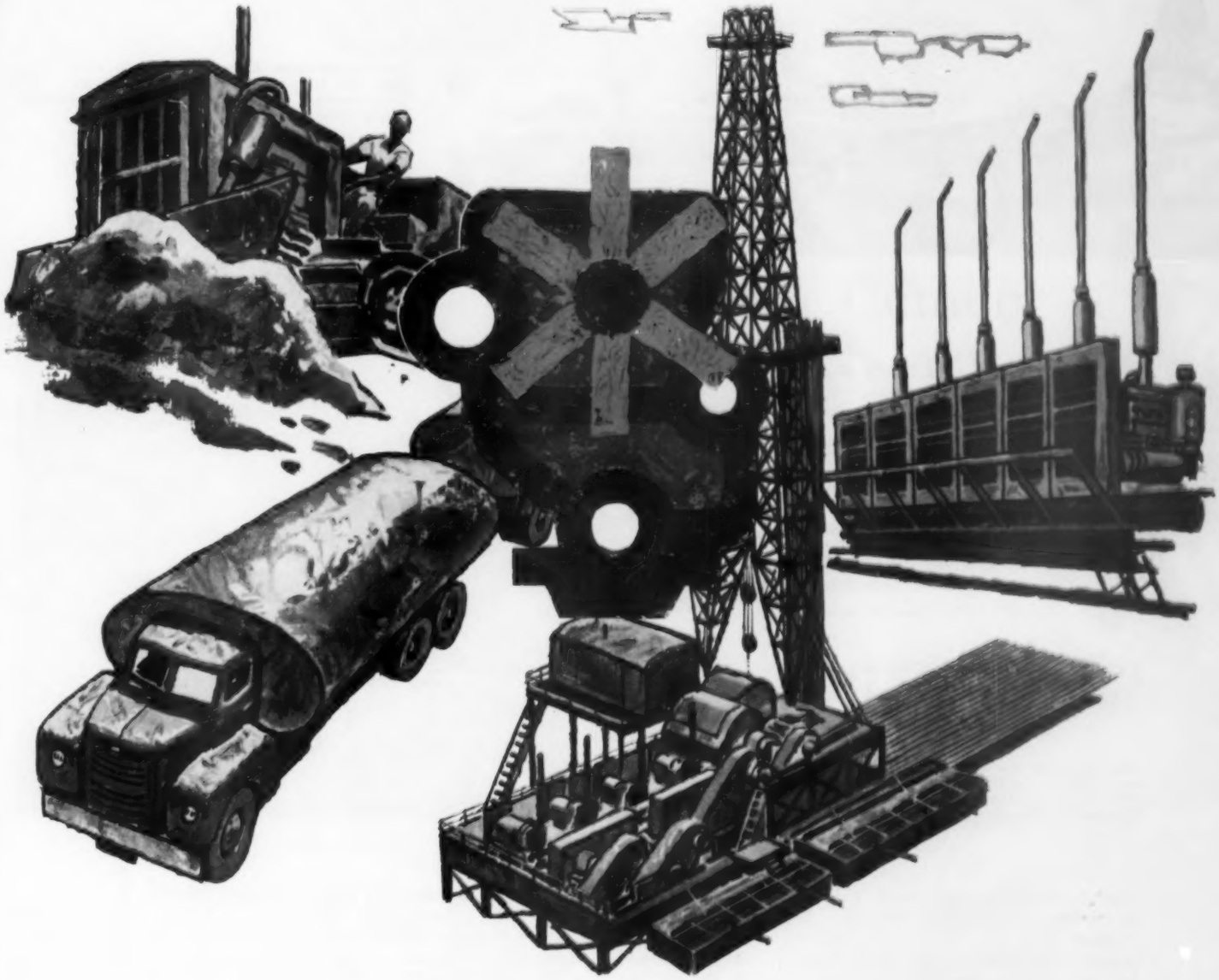
Company	Venezuela	Ecuador	Peru	Kuwait	Russia	Bolivia	Total
Y.P.F.	—	—	61,291	916,071	362,800	150,717	1,490,879
Esso	2,518,858	—	—	—	—	—	2,518,858
Shell-Diadema	1,763,211	—	—	—	—	—	1,763,211
Gral. Combustibles	—	45,781	30,348	—	—	—	76,129
La Issura	94,753	—	—	—	—	—	94,753
TOTAL	4,578,802	45,781	91,639	916,071	362,800	150,717	5,943,830

*One cubic meter equals 6.29 barrels. Source: Argentine Fuels and Energy Adm.

DIADEMA ARGENTINA S.A. de PETROLEO and SHELL ARGENTINA LTD.

Shell operates as an integrated company in Argentina, exploring under a new contract with YPF and carrying on a small producing, refining and marketing operation. The producing and refining company is known as Diadema, Argentina.

Investment Program: Shell has signed a contract for exploration with YPF over approximately 11,500 square miles in Buenos



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Whatever your oil field requirements, Cummins has the diesel for you. Cummins engines are at work in well-site clearing operations... building the camp... powering draw works, slushpumps, camp and rig electric utilities, rig-up trucks and other rolling stock.

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Another proven advantage of Cummins diesels is that certain crudes may be used as fuels.

Available in 4–6–8 and 12 cylinders from 60 to 600 h.p., Cummins 4-cycle diesels assure you of heavy-duty performance *with portability*.

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Affiliate: Cummins Engine Company, Ltd. Shotts, Lanarkshire, Scotland—Cables: CUMSCOT

Faster transportation has speeded Argentina's oil development. The turbo-prop Britannia shown belongs to TSA Transcontinental, the largest local airline in Argentina. Regular flights are made to New York.

Much of central Argentina resembles the USA's rocky plateau country of Wyoming or Utah. Here is an Esso truck having hard going in Neuquen Province (photo courtesy Esso SAPA).

Aires and Rio Negro provinces. A minimum of 1 million pounds ($2,800,000) is to be invested in the first two years; 2 million pounds in the following three years; 3 million pounds in the next three years and, if justified, 4 million pounds in the next two years. The company is obligated to begin exploration within 60 days, and to begin drilling on finding structures with possible oil accumulations. A pipeline is to be built "if economically and technically justified." No wells are drilling as of early June, 1960.

Shell announced during 1959 that $22.4 million would be invested in further expansion of its refineries.

ESSO S.A. PETROLERA ARGENTINA

Esso SAPA is an affiliate of Standard Oil Co. (New Jersey). Esso signed a contract with YPF on December 3, 1958 which gave the company new exploration areas for the first time in some decades. The company had been operating in the Dadin and Huincul areas where a total of 191 wells had been drilled of which 56 are currently in production, all pumpers, with about 200 b/d. The new exploration contract contains no drilling obligation. It calls for a minimum investment, however, of $10 million in exploration and production during the first three years, $13 million in the next three years, and $24 million expenditure on 50% of the area in the following four years if reserves and markets support a production of 25,500 b/d.

Esso has contracted seismic work with Robert H. Ray Service Co., which is currently carrying out work on the new area. An aerial survey is underway by a local Argentine company. Esso has two new Continental Emsco rigs rated at 12,500 and 10,500 ft. Two wells have been drilled in the Aguada de Toledo area without having obtained commercial production, and other wells are currently being drilled. The possible productive horizons are hard to define; the company says they may lay between 2,400 and 12,600 feet.

Esso has four refineries in Argentina. The company is building a fluid catalytic cracking unit at Campana (near Buenos Aires) at present, with Techno-Astar, a local firm, assisting Kellogg and Esso engineers in its construction.

Pipeline Construction: Esso's contract with YPF contains a pipeline construction commitment for investment of up to $23 million on a 14-inch crude pipeline from Challaco to Bahia Blanca, some 625 kilometers. Steel fabrication has been contracted with SIAT, an Argentine company, using 39,000 tons of German steel of which about 33,000 tons have been received. SIAT had delivered as of February 1, 1960 some 276 kilometers of pipe.

UNION OIL COMPANY OF CALIFORNIA

Union Oil Co. of California has a contract dated September 3, 1958 with YPF,

WELLS DRILLED BY YPF—1959

Field	Wells
Chubut	53
Santa Cruz	225
Neuquén	60
Salta	6
Mendoza	53
Total	397

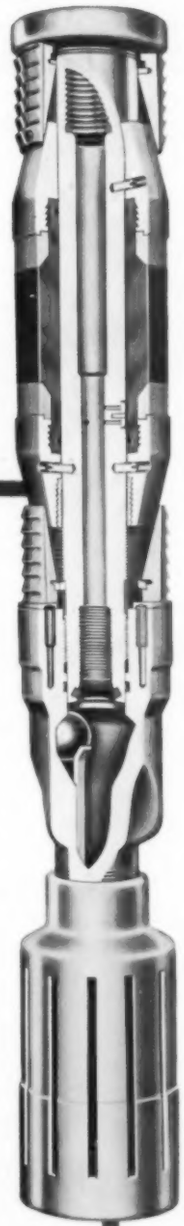
YPF PRODUCING WELLS IN ARGENTINA (AS OF MARCH 1, 1960)

Field	Wells
Chubut	1,232
Santa Cruz	546
Neuquén	361
Salta	75
Mendoza	260
Total	2,474

RUNS BY YPF REFINERIES DURING 1960 (PROJECTED)

Product	Cubic Meters
Crude Petroleum	8,629,400
Gasolines	1,815,800
Kerosine	826,030
Tractor Fuel	102,560
Gas Oil	455,700
Diesel Oil	619,495
Fuel Oil	4,193,915

Reliable The Baker Cement Retainer almost invented the word



BAKER CEMENT RETAINER
PRODUCT 400

Important Facts About The Baker Cement Retainer

1. It is used for any squeeze cementing operation.
2. It is run on wire line, tubing or drill pipe.
3. Packoff is uniformly positive and dependable at either high or low pressure differentials. Opposed slips hold from either direction.
4. Ability to maintain packoff is independent of fluid pressure, or of set-down weight or tension.
5. A back-pressure valve automatically holds squeeze pressure against the formation. You can swab-test before bringing the back-pressure valve into operation.
6. The Baker Cement Retainer drills up easily and quickly. It's available in drillable, corrosion-resistant cast iron or in fast-drilling magnesium.
7. There's a full range of sizes and a family of accessories to help get the job done in the best way.
8. In some areas it is used as a bridge plug, too. It can be run as a plug—or converted to a plug simply by dropping a ball after its use as a Cement Retainer.

The Baker Cement Retainer outperforms almost anything we can say about it—and it's been doing it for years. It has presided over tens of thousands of high pressure squeeze operations with outstanding success.

Is it dependable at high pressures? It is. It has been set successfully at depths below 20,000 feet.

Does it set and pack off well at low pressures? It does. It has been set in thousands of shallow and medium depth wells.

THE BAKER SERVICEMAN looms large in this picture. He's the man who helps you extract all of the resolute dependability that's built into a Baker Cement Retainer.

When there's a question about whether you want a drillable squeeze packer or a retrievable one, talk it over with a Baker man. He's got the two most respected squeeze packers in the industry—the Baker Cement Retainer (drillable) and the Baker Full-Bore Cementer (retrievable).

A Baker man also has something else that's important. He's got skill. He's a specialist, a real professional, in squeeze-packer techniques.

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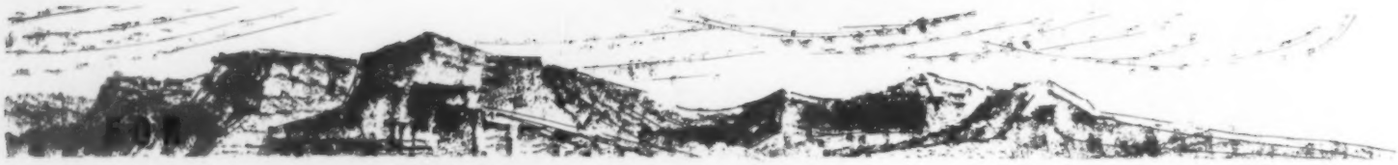


ARGENTINA'S

MORE RIGID DRILLING REQUIREMENTS

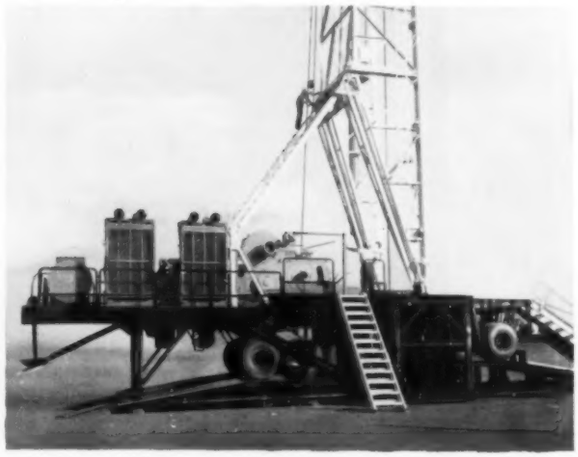
LEE C. MOORE

CANTILEVER MASTS

120 M.P.H. ACTUAL WIND LOAD CAPACITY PROVIDED BY NEW LEE C. MOORE MAST IN COMMODORO RIVADAVIA AREA

A new Lee C. Moore cantilever type portable, compact drilling mast, incorporating special design features, is now drilling in Argentina's Commodoro Rivadavia area where high velocity winds prevail.

This 100′ mast has a 120 M.P.H. actual wind load capacity with pipe racked in mast. Greater stability has been achieved through a special arrangement of the mast supporting structures to provide an extra wide base.



HIGHLY MOBILE DUAL TRAILER MOUNTED MASTS

Since the beginning of exploratory drilling in Argentina, Lee C. Moore Dual Trailer mounted masts have been an integral part of that nation's expanding oil economy.

This dual trailer design permits the use of a larger mast and heavier drawworks to be incorporated into a highly mobile rig. Mast, traveling block and wire line are carried on one trailer, and the drawworks with power group on another trailer. Drill line storage spool built into the mast trailer eliminates unstringing and restringing the blocks for each move.

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REFINERY RUNS IN ARGENTINA—1959
(In Cubic Meters*)

Company	National	Imported	Total
Y.P.F.	6,085,292	1,438,977	7,524,269
Esso	57,472	2,492,490	2,529,962
Shell	448,786	1,775,907	2,224,695
Petroquimica	200,923	—	200,923
Otras empresas	—	171,557	171,357
TOTAL	6,772,473	5,878,751	12,651,204

*One Cubic Meter equals 6.29 barrels. Source: Argentine Fuels and Energy Adm.

for the exploration of two areas in the Comodoro Rivadavia vicinity. It is one of the few pure exploration contracts and is actively being carried out at present.

Work Program: Union has contracted for a minimum investment of $5 million in the first two years; thereafter a minimum of $3 million. In any event, minimum investment must reach $8 million. Pipelines will be built by the company if marketable production is obtained.

Union is using two rigs, one heavy rig drilling in the area to the west, and a light rig drilling in the area to the east. As of February 5, three wells had been drilled. One found a six-foot pay zone and about 3,000 ft of oil came up in the hole, but it is not considered commercial unless more production can be found nearby which would justify production facilities in the area. A number of other wells are to be drilled around this area. Depths are about 5,000 to 6,000 ft.

The heavy rig is drilling on exploratory work at present, with depths uncertain but thought to range below 10,000 ft eventually.

L. & R. DEVELOPMENT LTD.

L. & R. Development Ltd. is owned by Carl M. Loeb, Rhoades & Co., 42 Wall Street, New York 5, New York. In Argentina the company is commonly called "El Banco"; it is not a bank but a medium sized investment house with considerable oil experience in the United States.

Argentine Investment Program: The contract between YPF and the company calls for a maximum investment of $100 million within specified areas of Argentina. There is no specified drilling program; however the company has hired Kerr-McGee as drilling contractor and has drilled over 100 wells in the contract area before April 1, 1960. Another rig was being sent down by Kerr-McGee at that time, making a total of six rigs in operation, five in the Mendoza contract area and one in the Comodoro Rivadavia area. The company concentrated most of its early effort on the Mendoza area but later began drilling in the Comodoro Rivadavia area to the south. The second well there was drilling during February, compared with over 100 completed by April 1960 in Mendoza.

The contract has as its objective to "rationally and effectively increase the production, transport and refining of petroleum, natural gas and other hydrocarbons . . . " Oil being produced now, around 11,000 b/d, is being transported to YPF refineries by rail tankcar.

SOUTHEASTERN DRILLING COMPANY

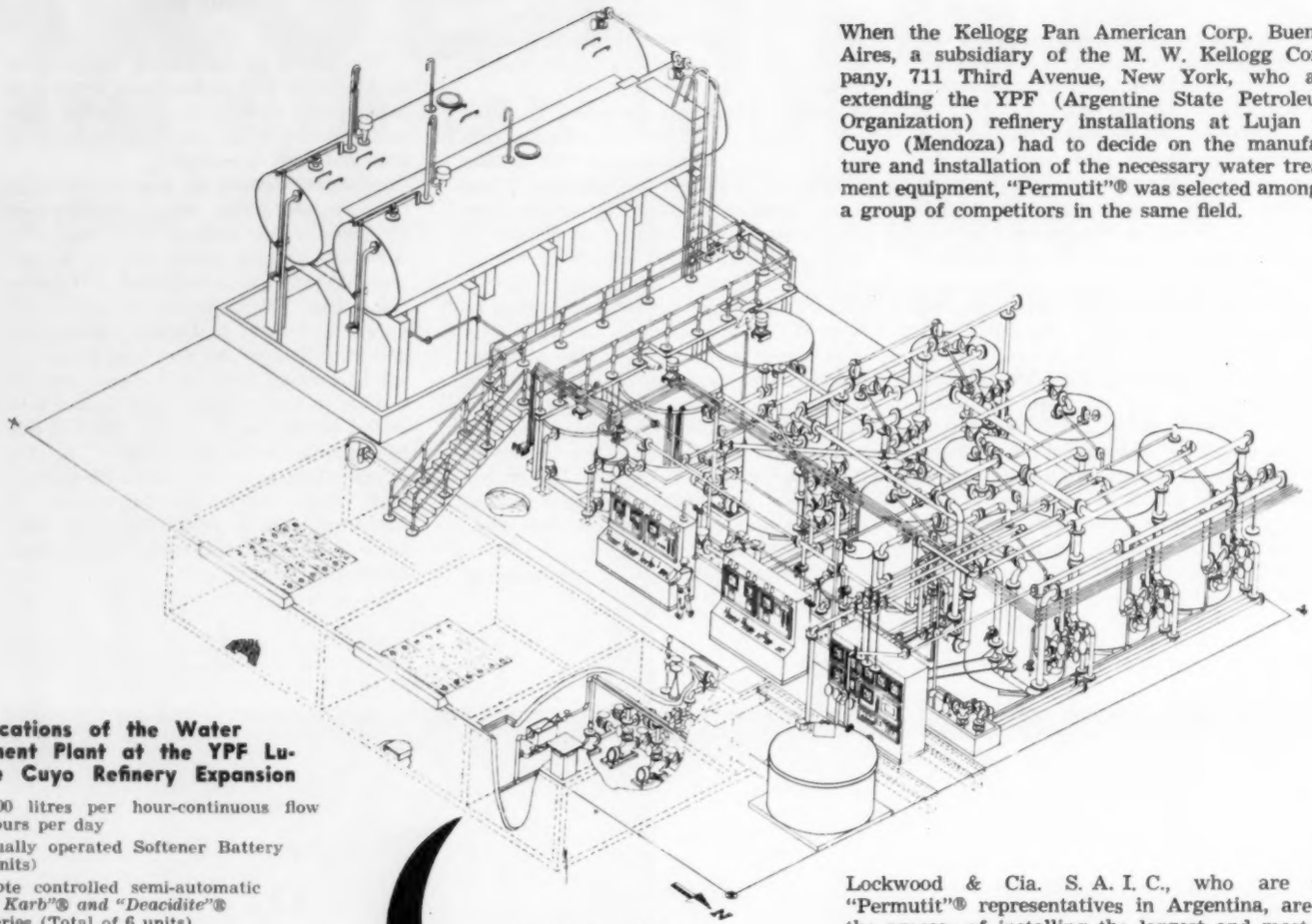
The largest of the drilling contracts let in Argentina to date has been awarded to Southeastern Drilling Co. Originally a three year contract, it has now been extended to four and work is underway.

Contractual Obligations: On the basis of a fixed fee per meter drilled, Southeastern Drilling Co. has undertaken to drill 1000 wells over a 4-year period. During the first year 100 wells are to be drilled; 270 during the second, 300 during the third and 330 during the fourth. At the height of the program five drilling and five completion rigs will be working. Two are skid mounted and two are on dual trailers. 25 wells had been drilled by the end of April 1960. 100 will be completed by the end of 1960. The area of operations is in Comodoro Rivadavia's south flank, where the government of Argentina plans to drill 4,700 wells eventually. Wells are now being completed in about seven days. END

Pan American built a crude pipeline to the coast in Comodoro Rividavia. This is a view of the main pump station at Cerro Dragon (photo by Pan American Argentina Oil Co.).

Argentine oil expansion program approves Kellogg's choice of "PERMUTIT"® water treating equipment for the YPF Refinery Expansion at Luján de Cuyo (MENDOZA)

When the Kellogg Pan American Corp. Buenos Aires, a subsidiary of the M. W. Kellogg Company, 711 Third Avenue, New York, who are extending the YPF (Argentine State Petroleum Organization) refinery installations at Lujan de Cuyo (Mendoza) had to decide on the manufacture and installation of the necessary water treatment equipment, "Permutit"® was selected amongst a group of competitors in the same field.



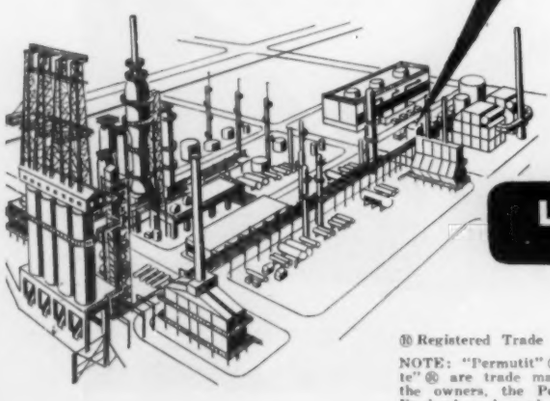
Isometric view of the Water Treatment plant.

Specifications of the Water Treatment Plant at the YPF Luján de Cuyo Refinery Expansion

- 170.000 litres per hour-continuous flow 24 hours per day
- Manually operated Softener Battery (3 Units)
- Remote controlled semi-automatic *"Zeo Karb"® and "Deacidite"®* batteries (Total of 6 units)
- Concentrated Bulk acid storage tanks (40 tons)
- Sodium carbonate solution storage tanks
- Underground salt saturator (120 tons)
- Regeneration effluent neutralizing disposal system
- Complete instrumentation and flow control panels
- pH and conductivity quality control
- Open air installation throughout

Lockwood & Cia. S. A. I. C., who are the "Permutit"® representatives in Argentina, are in the process of installing the largest and most up to date demineralization plant, designed and built entirely in Argentina according to the latest water treatment techniques.

This is proof of the high standard which has been obtained in local manufacture in Argentina, and of the foresight which "Permutit"® show in the world markets, such as in this case, where their representatives in this country are completely equipped to handle any major water treatment problem.



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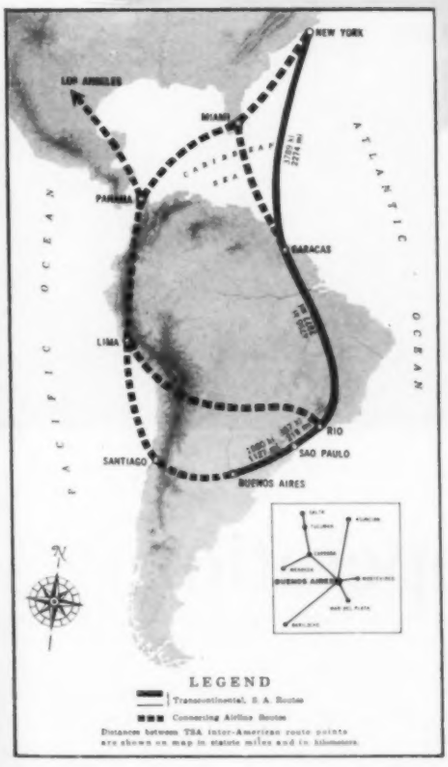

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Success of Kerr-McGee's year-old drilling operations at Mendoza, Argentina, weighed heavily in the company's decision to bid for YPF contract at Comodoro Rivadavia. Five drilling rigs are working on the Mendoza contract.

Kerr-McGee's drilling contract is progressing smoothly in Comodoro Rivadavia, where the company is carrying out a 500 well drilling and completion operation for YPF.

Argentine-American cooperation works for Kermac

Dr. Arturo Frondizi, president of Argentina, chats with workmen at Kerr-McGee's camp in Comodoro. Dr. Frondizi inspected the camp early this year.

On AUGUST 21, 1959, Kerr-McGee Oil Industries, Inc., and Yacimientos Petroliferos Fiscales (YPF), the Argentine state oil organization, signed a contract calling for Kerr-McGee to drill and complete 500 wells in the Comodoro Rivadavia area in Patagonia, southern Argentina. Kerr-McGee assigned the contract to its subsidiary, Transworld Drilling Company, Ltd.

The contract requires Kerr-McGee to provide the necessary drilling and completion tools as well as the personnel to staff the operation. Compensation is based on a per meter rate for drilling activities and an hourly rate for the completion operations. In general, Kerr-McGee's contract with YPF is similar to the usual domestic agreements.

The contract specifies the number of wells to be drilled by the end of each contract year, yet gives the contractor a limited leeway by allowing a margin on either side.

Period At End of:	*Contract Number of Wells*
first year	50
second year	185
third year	335
fourth year	500

The Comodoro field was evaluated by YPF geologists and geophysicists who determined that the area had several thousand proven undrilled locations. The oil field, which was discovered some 50 years ago, is Argentina's oldest and is conceded to contain the country's largest reserves.

The location of the contract area is in the southern part of Argentina, near the Atlantic ocean. The camp site is about 70 miles from the town of Comodoro Rivadavia, in the province of Santa Cruz. The latitude of the area is about 49 degrees south, which is as far south of the equator as Vancouver, British Columbia is north. The land is gently rolling and other than having oil is essentially a sheep ranching country. The altitude of the area is from 300 to 500 feet above sea level.

Kerr-McGee personnel first visited the Comodoro field in June, 1958, when two of the company's engineers made a preliminary study of the area and investigated available services. In January, 1959, Kerr-McGee was invited by YPF to participate in private tender No. 10338, bids for which had to be submitted no later than February 17, 1959, at 10 a.m. New York time. Upon payment of a fee, participating companies were provided with certain information including maps and well data to assist them in making their bids.

Kerr-McGee has engaged in contract drilling since the company was founded in 1929 by Robert S. Kerr, now senior United States Senator from Oklahoma and chairman of the company's board of directors. The company has maintained a strong interest in contract drilling, although it has since become fully integrated, thus is active in exploration, drilling, production, pipeline, refining, marketing and natural gasoline. A pioneer in offshore operations, Kerr-McGee drilled the first well in the open Gulf, offshore Louisiana, in the fall of 1947, using a tender-platform type drilling device which was to become the forerunner of many similar offshore rigs. It also has extensive interests in mining, particularly uranium.

The company's decision to submit a formal offer for drilling in Comodoro was based on many factors, one of which was the favorable experience the company was gaining from its operation in Mendoza.

In order to develop an efficient drilling program, months of prior planning and ordering of equipment were necessary. Since the contract specified the first of the 500 wells had to be spudded within four months of the contract date, speed was of the essence and necessitated a furiously paced, round-the-clock effort to purchase necessary equipment, test it, obtain the staff, ship everything to Argentina and go to work.

Since the work area is sparsely populated, it was necessary to make the entire operation as self-sustaining as possible. Because spare parts are not readily available in most foreign countries, replacement parts for every piece of equipment were purchased. To hold spare parts inventory at a safe operating minimum, an attempt was made to standardize everything in use. In some cases, entire basic assemblies have been placed in the company's spare parts stock to insure against the possibility of machinery failure which would cause a complete shut-down of one of the operations. The drilling rig and completion units were rigged up to the smallest details; changes and modifications as necessary were made on the spot. All the machinery was operated and tested. Then it was rigged down and crated for export.

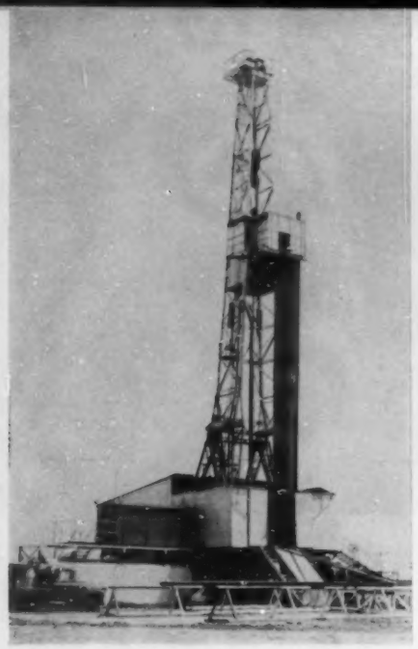
The climate of the area is not unlike parts of the Oklahoma-Texas panhandle. Wind velocities reported to be in the range of 100 miles per hour are not uncommon during October, November, and December. The equipment for the operation as well as the camp was designed and constructed to withstand the near zero winter temperatures and high wind velocities.

Rigs are winterized similar to those used in the Rocky Mountains except that the housing, when installed, moves with and is an integral part of the rig. Each rig is equipped with a steam generator and floor heaters.

The derrick and substructure for the drilling rigs are specially designed for additional strength and stability and are rated for a 120-mile-per-hour wind load without the use of guy lines. The mast for the completion unit is also specially designed and the substructure is equipped with an outrigger pyramid design which will permit it to withstand high wind velocities.

The drilling and completion operation was made not only self-sustaining but also highly mobile. Most importantly, the drilling rigs are constructed for skidding between locations, while the completion unit is trailer mounted on wheels. The mobility of the equipment contributes substantially to the speed with which wells are drilled and completed.

Kerr-McGee has drilling operations at Comodoro Rivadavia and Mendoza, Argentina. Headquarters at Buenos Aires is convenient to both locations.



One Continental Emsco GC-350-T-53H drilling rig and one completion rig have been on location at Comodoro Rivadavia since October, 1959. The second drilling unit and completion rig arrived at Deseado, the port nearest Comodoro, on May 3.

This is one of seven Kerr-McGee rigs now working in Argentina. The eighth rig arrived in Argentina on May 3.

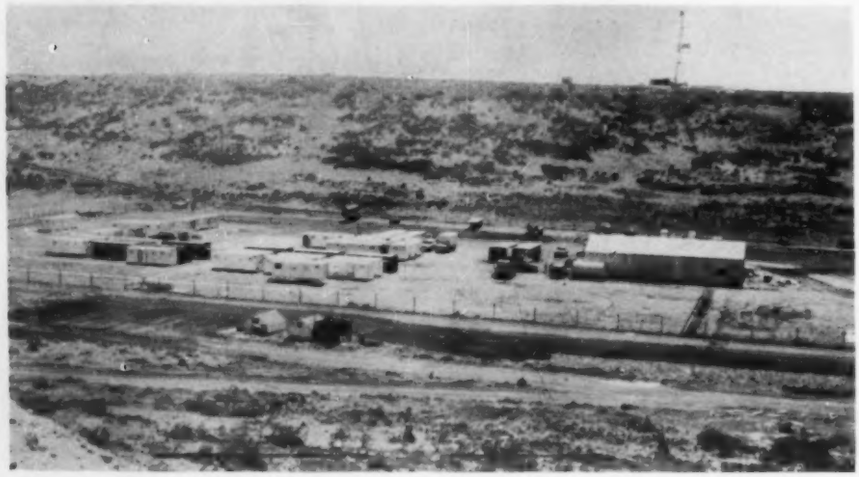
The complementary transportation equipment is considerably in excess of that needed for the usual domestic operation; because the contractor digs pits, houses fuel, all personnel, mud and cement, and also is required to transport the tubular goods and permanent well-head equipment of YPF furnished items. Kerr-McGee also does certain roadway and location work.

The surface of the ground is covered with rock conglomerate; roads are essentially unpaved—a combination which accounts for an unusual amount of damage to rolling stock. Broken windshields and flying rocks which knock holes in gas tanks and oil pans under engines are transportation hazards. As a precautionary measure, heavy equipment was equipped with guard shields, installed under certain vital parts of the vehicles, but even this was not sufficient. It was later found necessary to ship to the area industrial belting material which was installed on the vehicles for additional protection against the continual "rain of rocks."

Camp equipment provided by the contractor includes sleeping quarters, dining, laundry, and sanitation facilities, as well as needed supplies, shops, and even a water treating system. A radio base and tower is installed at the camp, with transmitter and receiver at each rig and in certain of the vehicles.

The first shipment of equipment to Comodoro Rivadavia left the United States on September 30, 1959—only slightly more than one month after the contract was signed—aboard the Argentine vessel, S. S. Granadero. For awhile, the success or failure of the Comodoro operation hinged on whether the Grenadero would set sail or be tied up indefinitely at the dock, due to a prescheduled strike of stevedores which was to begin at midnight, September 30. Kerr-McGee's spudding of the first well by the contract-specified deadline was at stake. With advance knowledge of the pending strike, authorities advanced the ship's sailing date and Kerr-McGee accelerated its preparation of equipment for shipment. The ship left port a few hours before midnight.

Comodoro Rivadavia camp includes 22 trailer houses which serve as office and radio building, serving and dining units, bake shop, kitchen unit, store room and laundry equipment; a cooler-freezer unit, bunk houses, a utility house and a water pressure and treating system.



Included with the drilling equipment in the initial two-million pound shipment was rolling stock consisting of six Auto-car tandem transport trucks, five passenger cars, three "pick-up" trucks, four panel trucks, four tandem trailers, a road grader, two bulldozers, and a truck-mounted cementing unit. Camp equipment included two trailer houses, an office and radio building, a dining unit, 10 four-man sleeper units, a utility house, and a water treating and pressure system.

Marine shipments from the Gulf Coast to Deseado, Argentina, the port nearest the Kerr-McGee area, require from 26 to 30 days, if there is a ship going directly to the port. The time en route is greater if the ship makes intermediate stops.

The S. S. Granadero docked at Deseado on October 25 and unloading of cargo was completed on the 28th. The camp and drilling equipment was immediately moved 100 miles by rail and truck to the area in Canadon Leon (Seco), where the camp was to be located. Assembly began immediately.

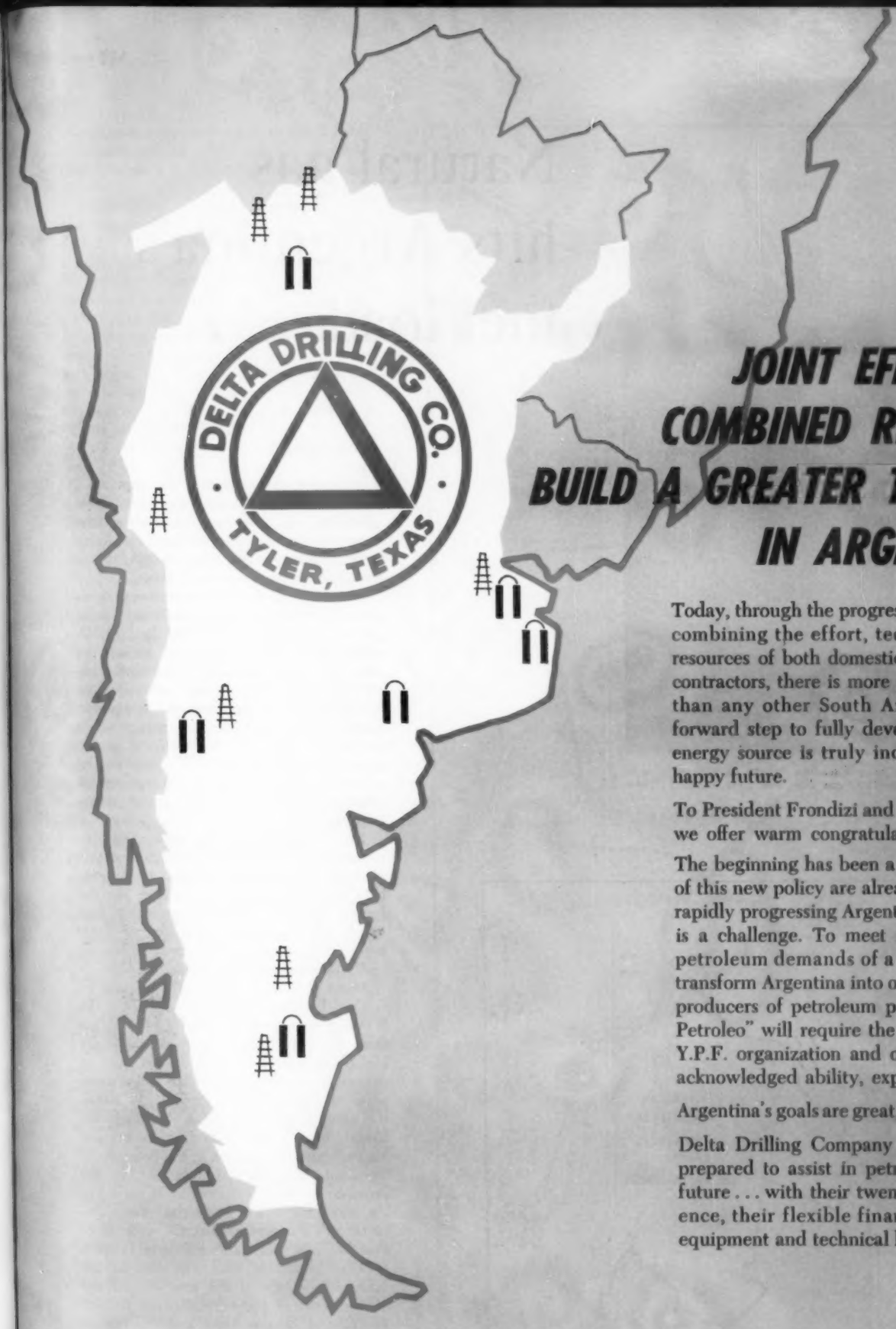
On November 15, the rig, without mast, was skidded to the first location. On November 20, the rat hole was drilled and the first well, C. L. 601K, was spudded at 2200 hours. Total depth of 4604 feet was reached on November 28—23 days before the specified spud date—at 4:30 p.m.

As work progressed, time-consuming difficulties were eliminated. Crews gained additional experience and confidence in each other and worked as an even more closely coordinated team. In the short span of a few months, the functional, but somewhat rough-running "motor," tuned itself into an efficient, smoothly-operating "machine." Elapsed time from spud on one well to spud on the next well has been reduced from twelve days to approximately five. This economy of time has been achieved by improving the efficiency of the drilling operation plus reducing down time from 30 hours to an average of 15 hours between locations. The relatively flat terrain contributes to the reduction of down time by permitting the rigs to be skidded between locations.

By the end of 1959, five wells had been drilled. Total footage of the wells was 23,500 feet, or an average of 4,700 feet per well. Of these five wells, two were completed last year. Two drilling problems—slight loss of circulation and excessive solids in mud—have been overcome without delaying drilling operations.

Grier D. Zimmerman, general manager of Kerr-McGee's Argentina operations, maintains headquarters in Buenos Aires, which enables him quick access to both the Comodoro Rivadavia and Mendoza locations. Before moving to Argentina, Zimmerman was regional manager of Kerr-McGee's Gulf Coast operations at Morgan City, Louisiana. He was graduated from

(*Continued on page* 82)



JOINT EFFORT... COMBINED RESOURCES BUILD A GREATER TOMORROW IN ARGENTINA

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To President Frondizi and the People of Argentina, we offer warm congratulations!

The beginning has been a great one . . . the effects of this new policy are already starting to show in a rapidly progressing Argentine economy. Tomorrow is a challenge. To meet the increasing domestic petroleum demands of a dynamic economy and transform Argentina into one of the world's leading producers of petroleum products, "La Batalla del Petroleo" will require the combined efforts of the Y.P.F. organization and of drilling contractors of acknowledged ability, experience and integrity.

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Another tie-in made near Tucuman brings completion of the Campo Duran-Buenos Aires gas line one river crossing closer (SARGO photo).

Natural gas lifts Argentina's fuel load

PETROLEUM EXPLORATION in Argentina, especially in new zones, has been quite promising and may have transformed the nation's power outlook in the last twelve months. At the same time, the gas industry has been given a strong boost.

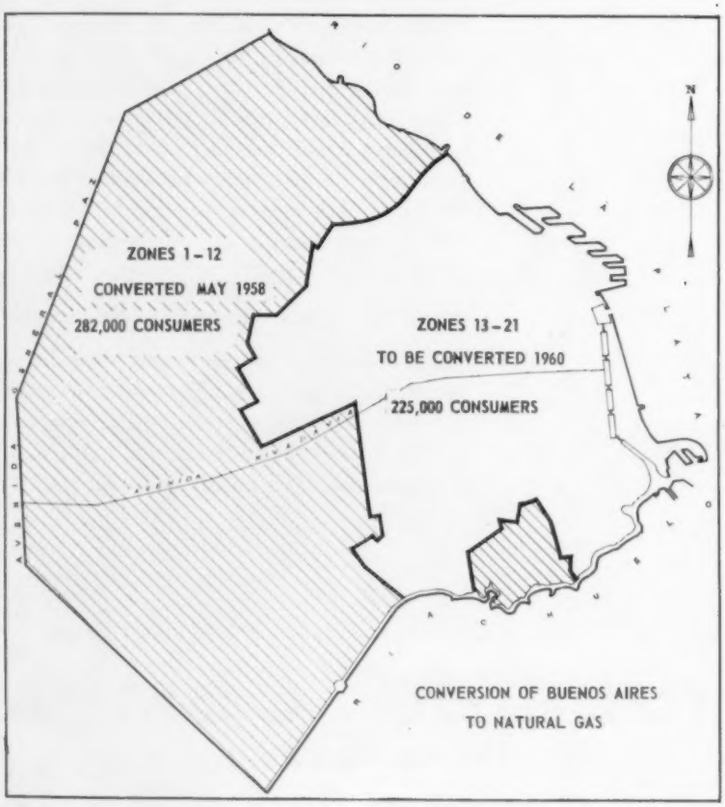
The first step in this direction was inauguration of the Campo Durán-Buenos Aires gas line, approximately 1,767 km. (1,100 miles) long, 24-inch diameter, joining the rich Salta fields with important consuming centers. This line started operating on March 18, 1959, and increased availability of natural gas by 700%, or 7 million cubic meters per day (247.3 mmcf/d), which gives a fair idea of the work and plans developed by Gas del Estado, the government office in charge of gas development in Argentina.

The Campo Durán line runs along the economic backbone of an important section of Argentina, an area crowded with industries vital to the national welfare. In the future they will consume Argentine fuel which will replace an equivalent of 7,000 tons of fuel oil per day formerly imported, and cost hundreds of millions of pesos.

About 200 installations are planned by Gas del Estado to distribute adequately the 7 million cubic meters daily of natural gas from Campo Durán. Many of these are already in operation, such as gas lines to the cement factory and the San Isidro sugar plant of Campo Santo, Province of Salta; the cement plant at Frías, Santiago del Estero; lines to sugar plants at San Juan, Lastenia and Concepción in the province of Tucumán; San Nicolás industries, in the province of Buenos Aires; to Rosario; to the most important industrial group situated in Villa Constitución, the environs of that city, and other large industrial centers.

Other important lines will start in the near future, such as the line to feed the modern cement plant installed in Barker, Province of Buenos Aires, and the line to sugar plants at Leales and Bella Vista in Tucumán.

The industrial gas line to Olavarría, a cement and lime zone in the province of Buenos Aires, was finished March 4, 1960 and an important ceramic industry began, based on gas. This gas line contributes to the solution of the power problems of the



nation, inasmuch as it supplies the natural gas equivalent of 1,000 ton/day fuel oil, now consumed in Olavarría by the cement plants.

International Gas Lines Planned Despite the magnitude of new construction, which includes the new 1,800 km gas line between Flanco Sud Cañadón Seco in the south and Buenos Aires, for the transportation of 10 million cubic meters of natural gas per day (353.1 mmcf/d), the government has had to introduce important changes to meet increase in demand. Expansion of gas services across the country's borders to supply natural gas to Uruguay, Paraguay and Chile is now being studied by the technical offices of Gas del Estado.

23-Fold Increase Within a three-to-four year period, Gas del Estado will transport 23 million cubic meters of natural gas each day (812.2 mmcf/d), from fields in the north, south and west of the Republic. This volume, compared with the one million meters (35.3 mmcf/d) presently distributed, gives a clear idea of the magnitude of the technical as well as the economical efforts necessary to make use of this rich resource to solve Argentina's fuel problem.

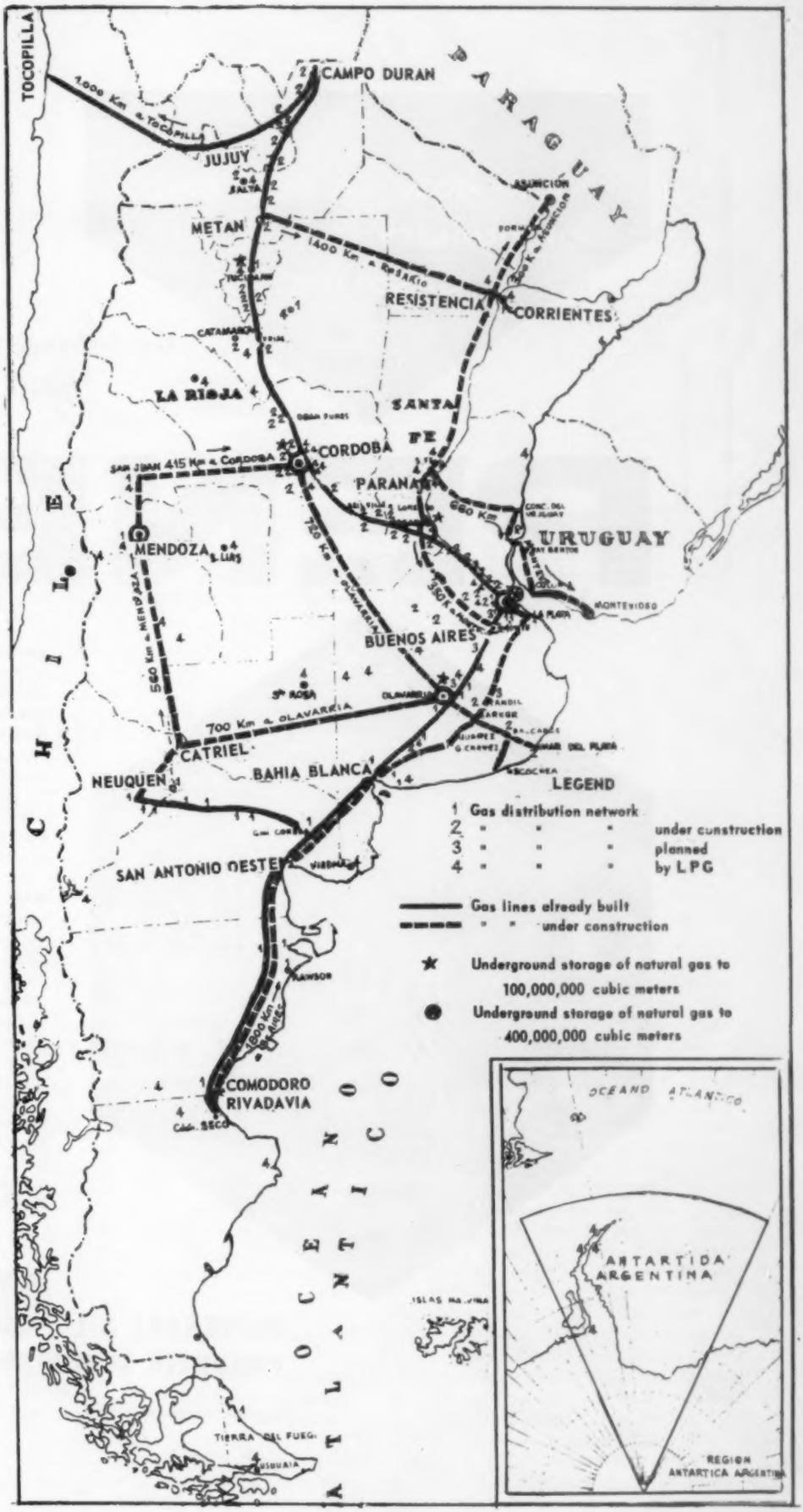
The ambitious project calls for expenditures of 36,000 billion pesos. It includes construction of various gas lines, some of them extensive, spreading the benefits of natural gas to many regions and giving them solid backing for the future. Densely populated cities with old industries as well as new industries needing economic support will find in natural gas an efficient ally for their prosperity.

Financing Gas del Estado is a government office that is no longer a burden on the national budget. Its economic backing is more private than official, since its projects are financed by its own earnings.

An example of this is the construction of branches for the Campo Durán-Buenos Aires gas line, the terminal of which is found in General Pacheco, Province of Buenos Aires. From this location to the general distribution center of San Martín, located in the Federal Capital, and with the connecting line to the electro plant in Puerto Nuevo, 90 km (56-miles) of lines have been constructed. The cost of 350 million pesos was paid by consumers who during the period of one year paid a fifty cent surcharge per 4,500 calories consumed, in order to make possible the branch line construction.

This was the first time that such a contribution had been requested from consumers. It is subject to reimbursement as promised and made legal through covering regulation. Its repayment will be made effective as from November 1, 1960, at which time a new economic period will start for Gas del Estado.

This procedure, applied in this country for the first time, was well received by the public. Its application will permit extension of the distribution network, benefitting a wider sector of the population by means of their direct or indirect contribution. END



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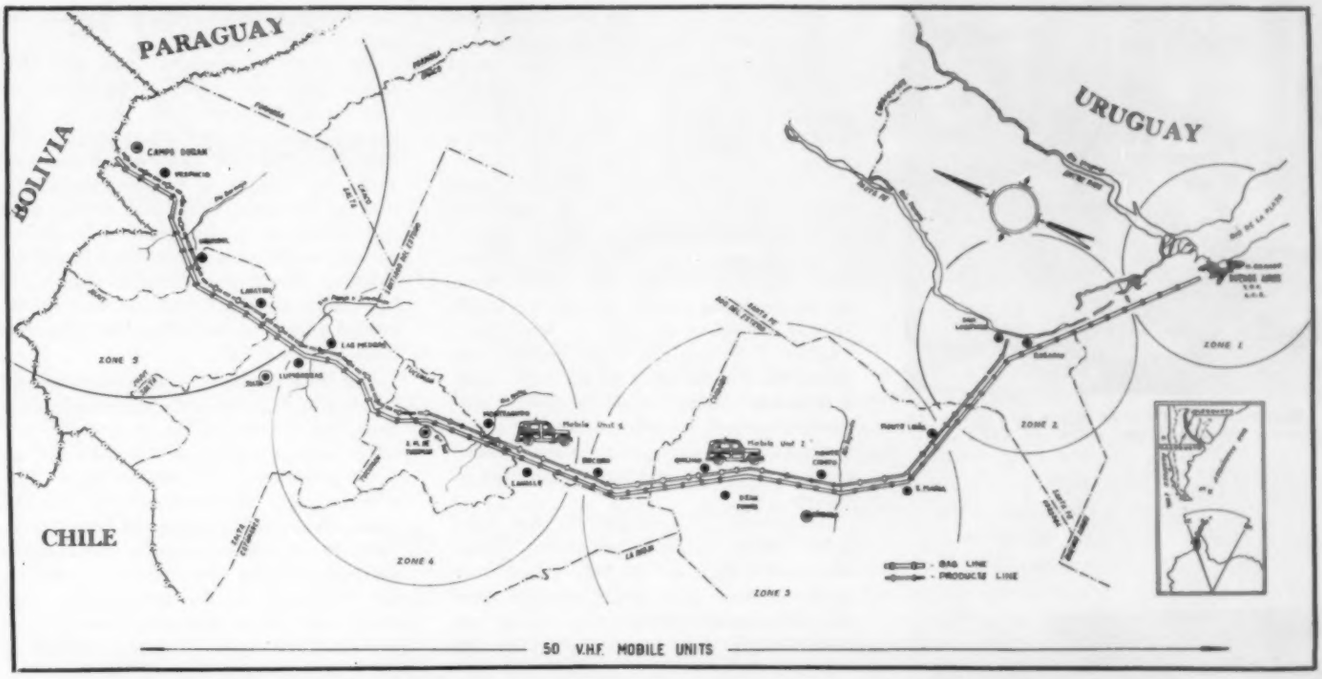


TEMPORARY COMMUNICATIONS SYSTEM—Pipelines from Campo Duran to Buenos Aires built for YPF by SARGO S.A.

Argentine company pioneers SARGO communications system

One of the principal projects of Yacimientos Petrolíferos Fiscales (Y.P.F.) is the Campo Durán-Buenos Aires oil and gas pipeline, bringing oil from the north of Argentina to consumption centers and thus helping solve Argentina's fuel problem.

A group of American companies obtained a contract under the name of Sociedad Anónima Argentina Obras Oleoductos y Gasoductos (SARGO) and work began in October, 1958.

On a line 1,100 miles long, crossing all kinds of wild areas, there was need of telegraphic and telephonic communication to permanently link the various camps along the line and communicate with the central offices in Buenos Aires. The State lines, already overloaded, could not absorb this additional 24 hour-per-day operation.

It was therefore decided to install a special radio electric communications system during construction of the line. Argentine and American technicians collaborated in installation of a temporary communications system using high frequency (SSB-HF), Very High Frequency (VHF-FM) and microwaves. There were fixed and mobile stations through all of which a permanent and private communications system would be maintained.

SARGO contracted with Intec International S.A. (INTEC) of Mineola, N. Y., for study and planning of H.F. and V.H.F. systems suitable for use in the various seasons of the year. Included were formation of the electronic engineers and technical teams, tuning up and maintenance 24 hours a day of the communications units to be installed, and geographical selection and installation of the repair shops and warehouses along the line, plus the technical and administrative organization to supervise the projected system.

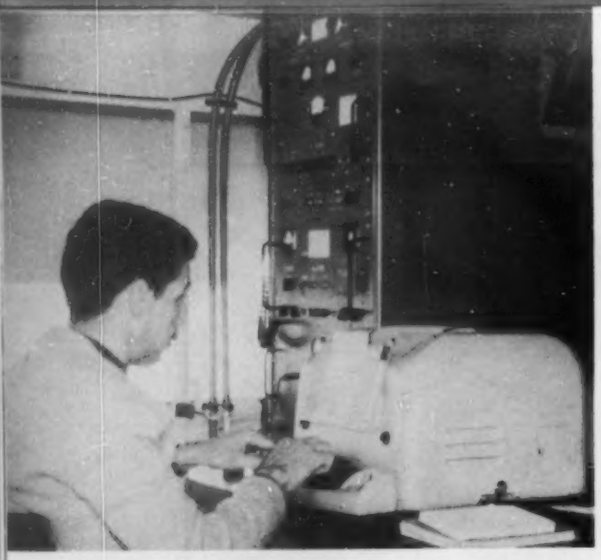
In November 1958 SARGO brought to the field locations all the necessary communications units needed for the project. By that time Intec had already formed its technical crews, composed of carefully selected Argentine electronic engineers and technicians. They were duly trained to work in wild zones, often very far from populated centers and had to face dangerous situations in the performance of their duties.

On November 16, 1958, SARGO approved the working plan by INTEC and installation of the fixed and mobile radio communications stations started as follows:

(a) *Buenos Aires Base Station near Buenos Aires, at Monte Grande:* A rhombic antenna was installed—three-curtain, copper-weld wire—major axis 855 ft., minor axis 282 ft., pointing north towards the province of Tucumán on a straight line distance of 672 miles from Buenos Aires; one 100-watt SSB-HF radio communications unit and one 60-watt VHF-FM unit, with vertical high-gain antenna to form a link with another similar unit installed in the central offices of SARGO in Buenos Aires.

(b) *Tucumán Base Station. Km. 600 (375 miles):* To be used as a relay station between Buenos Aires and Campo Durán Station, 1,100 miles, two rhombic antennas were installed—three curtain copper weld wire, major axis 855 ft., minor axis 282 ft., one pointing towards Buenos Aires Radio Station (Monte Grande) and the other pointing north toward Campo Durán (near the Bolivian border) with one 100-watt SSB-HF and one 60-watt VHF-FM unit to communicate with the mobile units in VHF-FM 25-watt, using high antennas.

(c) *Campo Durán Base Station:* One rhombic antenna similar to the one installed in Buenos Aires was installed, pointing south towards Tucumán Base Station, one 100-watt SSB-HF and one 60-watt VHF-FM unit to communicate with mobile units in VHF-FM 25-watt, installing vertical high gain antenna.



Operator on the Tucuman station, part of the temporary communications system by INTEC.

Teleprinter in use on the Buenos Aires to Tucuman stretch.

Shown in operation is one of the Eldico radio units used on the temporary communications system, with a Motorola Walkie-Talkie standing by.

(d) *Spread Station Campana and Spread Station at Villa María:* Radio communications units were installed in these two spread stations. They were 100-watt SSB-HF units, dipole antennas and VHF-FM 25-watt to communicate with similar mobile units.

(e) 26 VHF-FM 25-watt mobile units were installed in vans, pick-ups and trucks that were used by Sargo along the line.

Installation of the stations created technical problems such as installation of rhombic antennas in Campo Durán for which it was necessary to clear a forest area (Salta), plus the supply of all necessary elements for the operation of the radio communications units, including power generator sets and all other necessary implements as well as living quarters for the electronic technicians and radio operators in charge.

As operational quarters for the fixed radio communications stations, special shacks were built for the high temperature of the northern part of Argentina, to protect also against mosquitoes, snakes, and other hazards of the zone. Spread stations were mounted on trailers supplied by Sargo. These trailers were specially prepared to be utilized as radio stations and also served as living quarters for the technicians and radio operators.

Communications were started between base stations and spread stations, and between spread stations and the Buenos Aires HF station. There were also closed circuits in 40-mile areas with fixed and mobile VHF-FM units. Selected HF frequencies gave the expected result and it was possible with frequencies of 8 to 10 Mc/s (million cycles per second) in SSB operation to make direct links between the Buenos Aires station and Campo Durán, an approximate straight line distance of 1,000 miles.

While this first stage of installation, tuning up operation and maintenance of the radio communications units, was being performed, the second stage of the plan was being prepared. It included amplification of the Buenos Aires station, and installing between Monte Grande station and Sargo offices in Buenos Aires (9.7 miles) a microwave radio link with 2,000 Mc/s frequency in order to permit the use of a telephone patch with the SSB-HF unit installed in Monte Grande Station.

Thus, direct communication was possible from the desk of any responsible person in the head office to any radio station already installed or to be installed along the 1,100 mile line.

With the urgent development of construction (another spread station was added) it was necessary to install repair shops and warehouses to stock spare parts, including shops and central laboratory in Buenos Aires, as the headquarters of all installation and maintenance operations.

The line was then divided into five geographical zones in which maintenance centers and spare parts storage centers were installed, which served as headquarters for the electronic engineers and technicians who were sent to those zones.

Six electronic engineers and nine electronic technicians were distributed in the five zones of Buenos Aires, Rosario, Cordoba, Tucumán and Campo Durán. HF-SSB and VHF-FM radio communications units were installed in the third spread station in Tucumán. VHF-FM mobile units were increased to 38, installed in various vehicles servicing along the line. It was decided to install one SSB-HF and VHF-FM radio communications station in the central storage houses in Rosario (210 miles from Buenos Aires).

The third stage of the plan contemplated installation of more radio communications units and the setting up of new HF and VHF fixed as well as mobile stations from those projected in the second stage. Frequencies were increased for the SSB-HF units. Heavy traffic along the line was divided in two radio networks operating in different working frequencies but, following the needs of the construction, they could communicate between themselves and with the Buenos Aires terminal station.

There were installed, with 24 hour service, the following radio stations:

Main Terminal Station, Buenos Aires Sargo Offices: This station includes the following: (1) SSB-HF unit with telephone patch; (2) teleprinter system with reperforator in circuit with Rosario station; (3) VHF-FM unit for airplane traffic and radio-link with 8 VHF-FM mobile units installed in cars assigned to the Buenos Aires zone; (4) VHF-FM unit for airplane control and in circuit with central office in B.A.; (5) Microwave system in circuit with Monte Grande station, to link the two independent communications systems of the line. Antennas: dipole with reflector (HF) vertical high gain (VHF) whips (VHF) cigar (microwave).

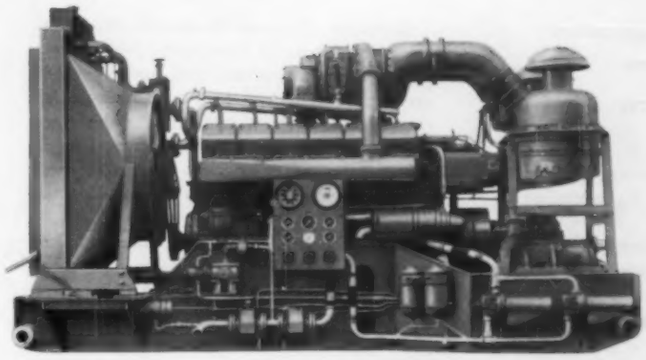
Monte Grande Station: (1) SSB-HF unit, interconnected through microwave units with B.A. central offices. Antennas: rhombic (HF) dipole (HF) cigar (microwave).

Intermediate Station—Relay Tucumán: (2) SSB-HF unit; (8) VHF-FM for airplane control, and radio link with mobile VHF-FM units in the zone of Tucumán or temporarily in this zone; (3) VHF-FM units in Sargo offices for radio link with Tucumán central station, railway offices and mobile units in the zone; (4) VHF units in Tucumán Railway Offices for radio link with Tucumán central station, Sargo offices and VHF-FM mobile units in the zone. Antennas: rhombic (HF)—dipole (HF) — vertical high gain (VHF) — whips (VHF). Accessory units: power generator sets.

Initial Line Station—Campo Duran: (5) SSB-HF with remote control; (6) VHF-FM unit for radio link with mobile VHF-FM units; (7) VHF-FM unit in Tartagal station to control airplanes and radio link with Campo Duran central station and VHF-FM

(*Continued on page* 88)

A range of engines for all requirements



Mercedes-Benz Diesel engines, in common with all the products of Daimler-Benz, are world-famed for their high performance, economy, robust construction and dependability. They have further advantages which are of particular importance for drilling operations. They have a large overload reserve, they are completely equipped for work on drill sites and they comply with the international safety regulations. 34 different Mercedes-Benz Diesel engines ranging from 20 to over thousand PS are available. This wide range includes the right engines to meet the specific requirements for drilling operations.

Types and Performance Data Type	Cooling	No. of cylinders Arrangement	Output PS (DIN)	Speedrange R.P.M.	Cyl. Bore ins.	Stroke ins.	Piston displacement cu. ins.	Weight approx. lbs.
M 202 B	W	2/S	35 – 55	750 – 1200	5 1/2	8 1/4	394.8	1665
M 203 B	W	3/S	54 – 90	750 – 1200	5 1/2	8 1/4	591.9	2150
M 204 B	W	4/S	72 – 120	750 – 1200	5 1/2	8 1/4	789.0	2715
OM 636	W	4/S	17 – 35	1500 – 3000	2 15/16	3 15/16	107.8	495
OM 312	W	6/S	47 – 77	1500 – 2400	3 9/16	4 3/4	279.5	784
OM 321	W	6/S	55 – 94	1500 – 2600	3 3/4	4 3/4	311.2	784
OM 315	W	6/S	80 – 124	1200 – 1800	4 7/16	5 1/2	505.0	1700
OM 326	W	6/S	97 – 155	1200 – 1800	5 31/64	5 1/2	660.0	1720
MB 851	W	1/S	9 – 20	1000 – 2000	4 1/2	5 1/2	88.8	662
MB 861	L	1/S	9 – 20	1000 – 2000	4 1/2	5 1/2	88.8	662
MB 852	W	2/S	18 – 40	1000 – 2000	4 1/2	5 1/2	176.9	915
MB 862	L	2/S	18 – 40	1000 – 2000	4 1/2	5 1/2	176.9	915
MB 853	W	3/S	27 – 60	1000 – 2000	4 1/2	5 1/2	266	1122
MB 863	L	3/S	27 – 60	1000 – 2000	4 1/2	5 1/2	266	1122
MB 854	W	4/V	36 – 80	1000 – 2000	4 1/2	5 1/2	354.4	1245
MB 864	L	4/V	36 – 80	1000 – 2000	4 1/2	5 1/2	354.4	1245
MB 846 A	W	6/S	114 – 250	750 – 1500	5 7/8	7 1/2	1230.2	3860
MB 846 B	W	6/Li	114 – 250	750 – 1500	5 7/8	7 1/2	1230.2	3970
MB 846 Ab ▽	W	6/S	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4080
MB 846 Ad ▼	W	6/S	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4200
MB 846 Bb ▽	W	6/Li	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4200
MB 836 B	W	6/S	240 – 375	1000 – 1500	6 7/8	8 1/16	1806.3	4380
MB 836 Bb ▽	W	6/S	320 – 525	1000 – 1500	6 7/8	8 1/16	1806.3	4830
MB 836 Db ▼	W	6/S	370 – 650	1000 – 1500	6 7/8	8 1/16	1806.3	5050
MB 820 B	W	12/V	460 – 750	1000 – 1500	6 7/8	8 1/16	3612.6	6180
MB 820 Bb ▽	W	12/V	640 – 1100	1000 – 1500	6 7/8	8 1/16	3612.6	6900
MB 820 Db ▼	W	12/V	770 – 1350	1000 – 1500	6 7/8	8 1/16	3612.6	7240
MB 837 A	W	8/V	165 – 440	1000 – 2000	6 1/2	6 7/8	1825	2940
MB 837 Aa ▽ ▽	W	8/V	215 – 550	1000 – 2000	6 1/2	6 7/8	1825	3020
MB 835 Ab ▽	W	12/V	840 – 1450	1000 – 1500	7 1/2	9 1/2	4773	8157
MB 835 Bb ▼	W	12/V	1015 – 1780	1000 – 1500	7 1/2	9 1/2	4773	8597
MB 839 Ab ▽	W	16/V	1120 – 2000	1000 – 1500	7 1/2	9 1/16	6380	11020
MB 839 Bb ▼	W	16/V	1350 – 2400	1000 – 1500	7 1/2	9 1/16	6380	11450
MB 518 B ▼ ▼	W	20/V	3000	1720	7 5/16	9 13/16	8201.5	10550

Note:
W = water cooling · L = air cooling
Li = horizontal · S = vertical
V = vee type · ▽ = with exhaust-turbo-supercharging ▼ = with exhaust-turbo-supercharging and boost intercooling · ▽ ▽ = with mechanical supercharging
▼ ▼ = with mechanical supercharging and boost intercooling

MERCEDES-BENZ DIESEL

Argentine-American Cooperation Works for Kermac

(*Continued from page 74*)

the University of Oklahoma in 1949, receiving a BS degree in Engineering Physics. He has been employed by Kerr-McGee since 1950.

Carl Lawson, formerly a toolpusher for the company's offshore operations in the Gulf Coast, is drilling superintendent at Comodoro Rivadavia. He has been with the company for 15 years.

Presently, there are thirteen North American supervisors in Comodoro, including a project superintendent, tool pushers, drillers, derrickmen and mechanic-welder. All camp help, such as cooks and bakers are Argentine nationals. Drilling crews, truck drivers, heavy equipment operators and other employees are also Argentine nationals.

Kerr-McGee North American and Argentine personnel work side-by-side compatibly; there is no animosity. The quarters and facilities of the camp are grouped within a fenced area, and identical accommodations are provided for both North American and Argentine personnel.

The lack of a common language is no barrier to efficient operations. None of the North Americans speak Spanish fluently although some obtained a limited knowledge of the language from working with Spanish-speaking peoples in the southwestern United States and in Cuba. Both English and Spanish-speaking employees at Comodoro quickly learned enough of the other's language to achieve effective communication.

The company is pleased with the caliber of Argentine personnel on the Comodoro project. They learn quickly and both their attitude and the quality of their work are excellent. Reports from Argentina indicate that the Nationals believe in "a good day's work for a day's pay."

North Americans sign up for a six-month single status hitch at Comodoro, with the exception of a limited number of supervisors who are on a family status. Their children are required to go to school, although staying in any foreign country is an "education" in itself. Kerr-McGee successfully established a school in Mendoza for children of its own personnel as well as for those of other operators and service companies in the area. With this experience, the company had little difficulty inaugurating a grade school in Comodoro, where the children study under a well-qualified Argentine instructor. Books are furnished by the company.

Kerr-McGee personnel at Comodoro entertain relatively few visitors from the "outside." However, one of the most famous men in South America, Dr. Arturo Frondizi, president of Argentina, inspected the camp early this year. He was accompanied by the Governor of Santa Cruz and Dr. Aguirre Legarretta, former president of YPF.

The second large shipment, alhough other smaller shipments have been made from time to time, consisting of 1,300,000 pounds of equipment, left Houston on April 3, 1960 on the S. S. Nopal Trader, which docked at Deseado on May 3. Included in this shipment was Kerr-McGee's Rig No. 53, a completion unit, rolling stock, supplies and additional camp buildings.

For air shipments of emergency supplies, the company has found it advisable to ship to Buenos Aires, where a representative clears the shipment through customs before transhipping it to Comodoro. The Argentine air line, Aerolinas Argentinas, serves Comodoro from Buenos Aires. Five to seven days are required for a shipment to reach its destination after the cabled request is received in the United States. This includes customs processing in the United States.

The record shows that 20 wells were drilled by Kerr-McGee from November 20, 1959, the day that the first well was spudded, to April 1, 1960. Of these, 13 were completed during the same time period. The company is confident that it will fulfill its contractual obligations within the specified time and looks forward to a continuing warm friendship with its friends in Argentina. END

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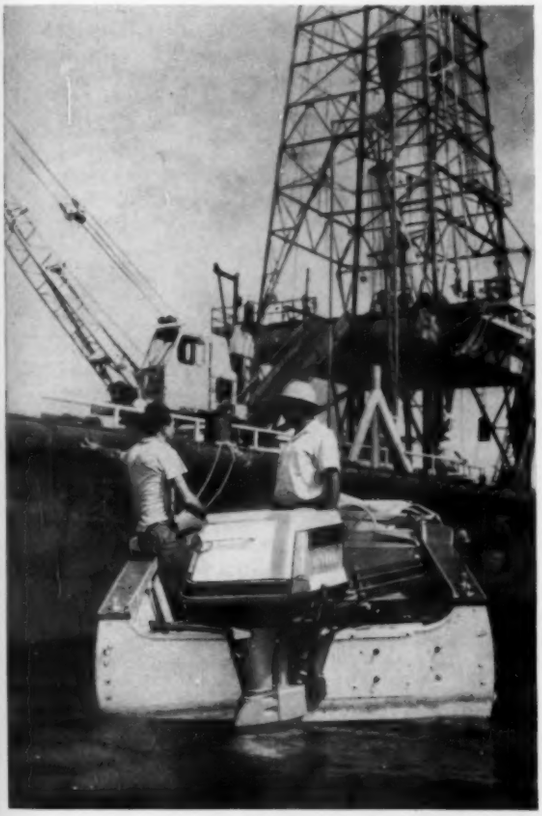

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Petrochemical growth in Argentina

by Bernardo Rikles

The country will benefit from well over $100 million in new petrochemical installations during the next few years.

A survey of current petrochemical developments in Argentina is a difficult assignment indeed because most projects announced in the last two years have not materialized yet, and many new proposals are being made to the government.

Another factor in the development of the manufacture of chemicals from petroleum and natural gas hydrocarbons came into the picture this year. Fabricaciones Militares (Army Ordinance work) has offered for sale large tracts of land in the vicinity of the San Nicolás steel mill of SOMISA — Sociedad Mixta Siderúrgica Argentina — for the erection of industrial plants.

Among the companies interested in the offer are the Fiat-Montecatini Group which requested 200 acres to erect plants for the production of 18,000 tons of urea, 94,000 tons of ammonium nitrate, 10,000 tons of dodecyl-benzene, 2,000 tons phthalic anhydride and 35,000 tons of sulfuric acid per year. Delta Oil Co., a local chemical organization, has requested 60 acres for erecting a plant to manufacture petroleum and tar derivatives.

A number of companies are using calcium carbide, fermentation alcohols and imported monomers as raw material to manufacture chemicals that in the USA and in some parts of Europe are being produced from petroleum and natural gas hydrocarbons. For example, Electroclor (I.C.I.) and Monsanto Andes (Monsanto Chemical Co.) started operation of their polyvinyl-chloride plants in Rosario and Mendoza respectively, with acetylene from calcium carbide produced in Mendoza using imported coke.

Monsanto and Química S.A. are manufacturing phthalic anhydride and other plasticizers from imported raw material.

Química S.A. and Bayer formed Fensud which is manufacturing phenol in San Nicolás from imported benzene. Now that SOMISA is operating its coke ovens, beginning March 1960, it is expected that Fensud will use benzene from the coke ovens whose capacity has been given as 7,000 tons of benzene per year.

Química S.A. is manufacturing ethylene oxide from fermentation of ethyl alcohol in a 250-ton-per-year oxidizing plant. It is manufacturing ethylene glycols and other derivatives.

The Koppers ethylene, polyethylene and styrene/plant to be erected near the YPF La Plata Refinery is in an advanced engineering stage, and it has been reported that construction should start in the second half of this year. Koppers investment is about $24 million. Plant capacities as announced are 7,000 (metric tons) polyethylene and 17,000 styrene.

Texas Butadiene and Chemical Corp. is engaged in preliminary engineering work in Puerto Deseado where a 30,000 ton butadiene and 40,000 GRS rubber plant is to be located. The investment is figured at $40 million. Texas is to receive styrene from Koppers.

Fish Engineering Co. has been authorized to invest $50 million in petrochemical plants. This concession has been attacked by political and nationalistic organizations. There is no definite information as to what Fish is to manufacture and where plants are to be erected. Originally they were to be constructed near San Lorenzo, to manufacture synthetic rubber. It has been reported that Fish has contacted the government of the province of Salta with a view to obtaining special permission to erect a plant in that province for manufacturing ammonia, fertilizers and other chemicals.

Mention should be made of the negotiations between Godfrey Cabot Co. as well as others—some of them Italian—for special authorizations for erecting carbon black plants to utilize natural gas from Tierra del Fuego which has no present commercial value.

Recent announcement has been made of a contract between Atanor (a company owned partly by the government and partly by private capital) and the Hooker Chemical Corp. named Duranor Industrias Químicas S.A. for the manufacture of phenol (at a rate of 25 ton per day) and other chemicals. This group has requested a loan of $2 million from the Export-Import Bank and Atanor is to raise its capital one billion pesos. ($12 million)

Duperial I.C.I. has finished engineering and is to start construction work on three plants at San Lorenzo for the manufacture of hydrogen peroxide, carbon bisulfide and sulfuric acid. These three plants, it is said, are the basis of an I.C.I. integrated chemical center in Argentina. As is known, San Lorenzo is the terminal of the multi-product pipeline from Campo/Duran which has a capacity of 4,100 barrels of liquid propane per day and an equal amount of butane, and other petroleum derivatives to be obtained in a topping plant being erected by YPF in Campo/Duran to treat the condensate and recover liquid hydrocarbons from this field and Madrejones field in the north of Argentina.

The manufacture of plastic products and materials as well as detergents, insecticides, pesticides, and other synthetics is increasing steadily, stressing more and more the demand for polystyrene, polyvinyl-chloride, polyethylene, formaldehyde, dodecyl-benzene, etc.

Esso S.A. Petrolera Argentina, affiliate of Standard Oil (New Jersey) and Diadema Argentina, Shell Group, have enlarged their chemicals sales departments and are out to get most of the local market for ketones, higher alcohols, pesticides, insecticides, fungicides, dodecyl-benzene, etc. Both companies are seriously contemplating entering the production of unsaturates, aromatics and other intermediates for synthetic chemicals. No announcements have been made by any of these pioneers in petrochemicals in other parts of the world, as to their plans for this activity in Argentina.

Ducilo, affiliate of Du Pont de Nemours, and the Italian Group Sniafa now manufacturing nylon at a rate of some 1,000 tons per year, are planning to erect monomer plants for the production of caprolactam,

(*Continued on page 94*)

FORECASTS OF ARGENTINE CONSUMPTION OF SOME SYNTHETIC CHEMICALS AND HYDROCARBON MANUFACTURED PRODUCTS

These forecasts have been made by different agencies, including Fabricaciones Militares, CEPAL, Argentine Petroleum Institute and others.

PRODUCT	Estimated Consumption (Metric Tons Per Year) 1962	1967
Carbon black	10,000	16,000
Acetone	—	16,000
Acetic acid	—	7,000
Methanol	—	25,000
Formaldehyde	8,000	18,000
Ammonia (excludes fertilizers)	—	20,000
Benzol	20,000	30,000
Synthetic rubber	40,000	70,000
Acetylene	—	16,000
Vinylpolychloride	9,000	12,000
Detergents	12,000	18,000
Styrene	12,000	20,000
Phenol	14,000	25,000
Phthalic anhydride	1,000	3,000
Nylon	2,000	4,000
Ethylene oxide	2,000	4,000
Propylene oxide	—	4,000
Polyethylene	7,000	10,000
Polypropylene	—	3,000
Polystyrene	7,000	8,000
Aromatic solvents	10,000	20,000
Toluene	6,000	10,000
Carbon tetrachloride	4,000	6,000
Trichloroethylene	3,000	4,000
Xylenes	—	1,500
Urea	2,000	3,000

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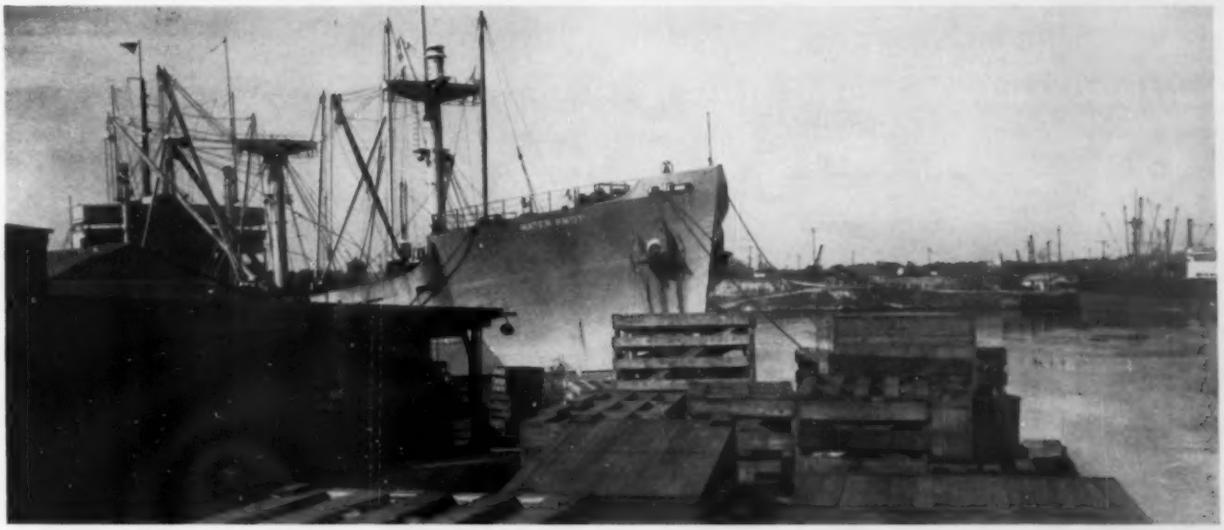

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Argentina's API

JULY 30, 1960 marks the third anniversary of Argentina's API, the Instituto Argentina de Petroleo. The Argentine Petroleum Institute, as it is known in English, was organized after discontinuance of the former South American Petroleum Institute when Argentina, Brazil and Uruguay decided to organize local independent units.

The Argentine Petroleum Institute has now 57 corporate members and nearly 400 private members. Oil companies, manufacturers and suppliers of oil equipment as well as some of large consumers of oil products are corporate members; oil petroleum engineers, chemists and other professionals active in the industry, are private members.

Main purpose of the Institute to foster and coordinate technical and scientific studies related with the petroleum industry in Argentina; to cooperate in training capable national professionals in oil technology, and to provide means and ways for promoting mutual acquaintance among technicians of oil companies and of all other corporate members.

The Argentine Petroleum Institute publishes a bimonthly magazine "Petrotecnia", containing technical articles, lectures and abstracts of scientific work on oil.

The Institute, in cooperation with the Argentine Standard Association "IRAM", is working on the preparation of standards for materials for the local petroleum industry. As a member of the Argentine it also cooperates with other technical institutions who have to do with utilization of petroleum production.

The work of the API is carried out by 12 committees, namely: 1) Standards for oil materials; 2) Codes for construction of oil and gas equipment; 3) Sampling and measurements of oil and gas; 4) Fire and safety protection; 5) Education and teaching; 6) Public relations; 7) Statistics; 8) Lectures and technical meetings; 9) Promotion; 10) Library and technical abstracts; 11) Publications and magazines; 12) Glossary.

Bernardo Rikles, President
Argentine Petroleum Institute

The Argentine Institute published in 1952 a very useful English-Spanish, Spanish-English glossary of terms used in the petroleum industry and will issue in 1960 a second revised and enlarged edition of this glossary.

President of the API is Ing. Bernardo Rikles (Tecnastar S.A.); vice president is Ing. Hector Gonzalea (YPF); secretary is Ing. José F. Soler (ESSO, S.A.P.A.), and asst. secretary is Ing. Martin T. Aranguren (Lottero Papini y Cia.). END

World Petroleum Statistics

FREE WORLD SUPPLY AND DEMAND, CRUDE AND PRODUCTS, OCTOBER 1959

(Thousands of barrels)

Source: USA Bureau of Mines, Division of Petroleum.

Country	CRUDE PETROLEUM					REFINED PRODUCTS			
	Production	Imports	Exports and reexports	Stock change, other demand, and loss	Total 1/ refinery input / Total 2/ refinery output	Imports	Exports and reexports	Apparent domestic demand (incl. bunkers)	Bunkers-all flags (as reported)
NORTH AMERICA									
Canada	13,123	10,575	3,307	+252	22,478	4,342	95	3/26,285	
Mexico	8,040	-	-	-139	8,751	575	930	8,396	
United States (incl. Alaska)	214,248	30,355	858	+7,279	252,320	17,884	7,887	3/268,539	6,371
Subtotal	237,411	40,930	3,565	+7,402	283,549	22,801	8,312	303,220	
CENTRAL AMERICA AND CARIBBEAN									
Costa Rica	-	-	-	-	-	E/ 95	-	95	
Cuba	15	2,841	-	-295	2,351	E/366	-	2,717	
Dominican Republic	-	-	-	-	-	E/165	-	165	
El Salvador	-	-	-	-	-	E/144	-	144	
Guatemala	-	-	-	-	-	E/249	-	249	
Haiti	-	-	-	-	-	E/ 72	-	72	
Jamaica	-	-	-	-	-	499	-	499	
Nicaragua	-	-	-	-	-	E/ 90	-	90	
Panama, Canal Zone	-	-	-	-	-	525	161	364	295
Panama, Republic	-	-	-	-	-	E/175	-	175	
Puerto Rico	-	2,442	-	-142	2,678	456	1,050	2,084	
Subtotal	15	4,483	-	-437	5,029	2,836	1,211	6,654	
SOUTH AMERICA									
Argentina	3,912	3,143	-	+416	6,641	1,732	9*	3/7,899	
Bolivia	269	-	78	-26	217	8	-	225	
Brazil	2,277	E/2,990	E/1,109	-872	5,030	E/1,324	-	8,354	
Chile	577	413	-	+269	E/721	E/595	-	1,316	
Colombia	4,720	-	2,326	+173	2,291	-	199	3/1,531	
Ecuador	236	-	-	-17	253	75	-	328	
Netherlands Antilles	-	E/21,264	-	-940	23,881	E/1,496	E/19,361	4/6,016	
Paraguay	-	-	-	-	-	E/ 48	-	48	
Peru	1,498	-	157	-64	1,419	150	270	1,299	19
Trinidad	3,540	2,304	484	+231	5,252	E/108	E/3,916	4/1,444	1,366
Uruguay	-	642	-	-86	728	184	-	912	
Venezuela	85,145	-	58,554	+763	25,828	E/ 47	E/23,243	3/3,808	1,365
Subtotal	102,174	30,856	62,698	-153	72,261	7,767	46,998	33,180	
WESTERN EUROPE									
Austria	1,430	187	575	-82	1,179	453	43	3/1,709	
Belgium and Luxembourg	-	3,875	-	+246	3,664	1,853	1,370	4,147	
Denmark	-	-	-	-21	21	3,120	4	3,137	159
Finland	-	743	-	+143	E/600	582	-	1,182	
France	1,063	20,321	-	+1,827	19,557	1,086	4,050	3/15,481	972
Germany, West	3,210	11,880	-	+1,062	13,628	2,942	2,021	14,549	
Greece	-	851	-	+38	813	158	-	971	
Iceland	-	-	-	-	-	298	-	298	
Ireland	-	968	-	+122	846	171	-	1,017	
Italy	969	15,784	113	-736	17,384	689	3,575	3/12,063	896
Netherlands	1,042	6,134	-	-1,500	10,028	2,458	5,662	6,824	505
Norway	-	132	-	+53	79	2,954	-	3,033	
Portugal	-	1,078	-	+208	870	281	46	1,105	
Spain	-	2,856	-	+315	E/2,594	204	-	2,798	
Sweden	-	2,056	-	+486	E/1,570	4,811	83	6,298	
Switzerland	-	-	-	-	-	1,822	-	1,822	
United Kingdom	60	23,257	-	-619	23,936	8,129	5,807	3/25,563	2,420
Yugoslavia	374	E/400	-	+126	E/648	E/ 70	E/ 46	672	
Subtotal	8,148	90,062	688	+1,668	97,417	32,075	22,707	102,663	
MIDDLE EAST									
Aden	-	2,809	-	+312	2,497	849	1,340	4/2,006	1,956
Bahrain	1,395	4,714	-	+ 14	6,095	22	5,072	E/1,045	340
Iran	29,365	-	17,740	+366	E/11,259	-	9,198	2,061	
Iraq	28,233	-	E/27,207	-	E/1,026	E/ 2	-	1,028	
Israel	62	E/688	-	-	E/750	E/977	-	1,727	
Jordan	-	-	-	-	-	E/ 96	-	96	
Kuwait	43,766	-	37,407	+ 1,890	4,469	-	2,512	4/1,957	1,467
Lebanon	-	E/490	-	-	E/490	E/ 22	-	472	
Neutral Zone	3,677	-	E/3,550	-323	E/1,050	-	E/660	390	
Qatar	5,173	-	E/5,157	-	E/ 16	-	-	16	
Saudi Arabia	33,054	-	27,936	+269	5,849	2	3,228	3/1,677	
Turkey	236	-	-	+25	211	985	-	1,136	
U.A.R., Syria	-	-	-	-	-	17	-	17	
Subtotal	144,961	8,661	118,997	+1,953	32,672	2,912	22,010	13,628	
AFRICA									
Algeria	870	-	567	+303	-	674	-	3/696	
Angola	37	E/ 38	-	-	75	73	-	148	
Belgian Congo	-	-	-	-	-	330	-	330	
Canary Islands	-	E/1,763	-	-67	E/2,024	E/ 46	E/1,431	639	
Ethiopia	-	-	-	-	-	E/ 57	-	57	
States formerly in French Equatorial Africa	458	-	E/458	-	-	E/ 80	-	80	
French West Africa	-	-	-	-	-	E/339	-	339	
Ghana	-	-	-	-	-	E/374	-	374	
Kenya	-	-	-	-	-	353	70	283	
Liberia	-	-	-	-	-	E/ 32	-	32	
Madagascar	-	-	-	-	-	E/ 74	-	74	
Morocco	70	E/ 48	-	-	118	E/435	-	3/331	
Nigeria	403	-	E/403	-	-	496	-	496	
Rhodesia & Nyasaland	-	-	-	-	-	E/323	-	323	
Sudan	-	-	-	-	-	183	-	183	
Tanganyika	-	-	-	-	-	165	37	128	
Tunisia	-	-	-	-	-	278	-	3/291	
Union of South Africa	-	966	-	+125	841	1,951	32	2,700	
U.A.R., Egypt	1,987	E/556	743	-	E/1,800	E/1,030	E/ 12	2,818	
Subtotal	3,825	3,371	2,171	+361	4,858	7,293	1,642	10,522	
SOUTH ASIA, FAR EAST, AND OCEANIA									
Australia	-	6,821	-	-79	7,231	910	908	7,233	607
British Borneo	3,401	-	3,907	-	E/1,494	E/103	E/1,907	390	
Burma	332	-	-	+ 1	331	E/ 45	-	376	
Ceylon	-	-	-	-	-	596	1	595	
India	264	E/3,414	-	-	E/3,678	E/6,500	E/ 87	10,091	
Indonesia	11,819	E/423	5,675	-	E/6,567	E/122	E/7,105	1,584	
Japan	272	14,614	-	+1,061	13,825	2,931	211	16,545	
Korea, South	-	-	-	-	-	38	-	3/497	
Malaya and Singapore	-	-	54	-54	-	3,709	1,555	2,154	
Netherlands New Guinea	136	-	E/136	-	-	-	-	Insig.	
New Caledonia	-	-	-	-	-	E/ 31	-	31	
New Zealand	-	-	-	-	-	1,273	-	1,273	
Pakistan	210	-	-	-7	217	E/874	-	1,091	
Philippines	-	716	-	+58	658	E/562	-	1,220	
Taiwan	1	580	-	-	581	218	-	799	
Thailand	-	-	-	-	-	694	-	694	
Vietnam, South (includes Cambodia)	-	-	-	-	-	E/272	-	272	
Subtotal	16,435	26,508	7,772	+ 900	34,522	18,938	9,074	44,845	
WORLD TOTAL EXCLUDING EASTERN EUROPE, U.S.S.R., & MAINLAND CHINA	512,969	204,871	195,891	+11,774	530,308	94,022	111,954	514,712	

E/ Estimate based on latest available data.
1/ Total input includes crude runs to stills plus runs of other unfinished oils, topped crude and natural gas liquids blended.
2/ Total output includes refined product output plus refinery fuel and loss.
3/ Domestic demand as reported, including stock changes.
4/ Apparent domestic demand is heavily influenced by refinery fuel and losses, bunker loadings, and stock changes.
* The figure shown for exports of refined productsfrom Argentina in the September release, WPS No. 138, was in error; exports for the month were insignificant.

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SARGO Communications System

(*Continued from page 80*)

mobiles in the zone. Antennas: rhombic (HF)—dipole (HF)—vertical high gain (VHF)—whips (VHF); accessory units; power generator sets; Rosario warehouse and shop station; (8) SSB-HF unit with remote control in Rosario warehouse station; (9) SSB-HF unit in Rosario warehouse station; (10) Teleprinter without reperforator in Rosario warehouse; (11) VHF-FM unit in airport to control airplanes and radio link with mobile VHF-FM units in the zone. Antennas: dipole (HF) — vertical high gain (VHF)—whips, (VHF).

Spread Stations Along the Line A total of 14 radio stations were scattered along the 1,100 mile line. Each radio station had one SSB-HF unit and one VHF-FM unit with dipole (HF) antennas and vertical high gain or whip (VHF) antennas, for the control of Sargo's airplanes and used as a radio link with VHF FM mobile units in the zone.

These spread stations—three basic camps —moved along the line during the period of the gas line construction. The camp superintendent was in constant touch with other activities up the line through these units, as well as with the head office in Buenos Aires. These units on many occasions saved the lives of men working on this line.

Compressor Stations Temporarily, and with the purpose of facilitating line construction and then testing the line, four radio communication stations were installed in four compressor plants, each of them having one SSB-HF unit and one VHF-FM unit to keep in contact with the planes, with mobile units in a position to contact airplanes, and with other mobile VHF-FM units in the zone.

Pump Stations A radio communications station was installed similar to those in the compressor stations. Mobile units (cars, pick-ups and trucks), including 34 VHF-FM two/three way units, provided a link with fixed radio stations or spread stations as needed. These units were installed in various places along the Campo Durán/Buenos Aires Line.

As the termination date of the construction of the line approached, the fourth stage started, testing of the temporary communications general plan.

A radio communications station in SSB-HF was installed in Campo Durán (Salta) to operate with the testing system. Two stationwagons served as complete radio stations alongside the line to help radio link operations during testing. Each unit had one SSB-HF unit, one VHF-FM unit, dipole antennas (HF) and whips (VHF) with power generator sets. These stations formed radio links in special frequencies with HF stations on the line and with other VHF-FM mobile units in the zone.

Portable VHF-FM units, "Handie-Talkie" were useful during testing for instructions in the camps or between airplanes and the testing areas which had no fixed or mobile unit.

This was a first in the electronic history of Argentina for work such as that done on the northern gas line from Campo Durán to Buenos Aires, work that has given the engineers and technicians concerned a vast experience and specialization in new jobs.

A French company, Campagnie Générale de Télégraphie Sans Fil, with much experience in this type of work, is now building the permanent communications system with a microwave system with a frequency of 2,000 Mc/s (2,000 million cycles per second; wave length: 0.15 meters) which will permit supervision of the development, watching, maintenance and control, by the following services: (1) transmission of a VHF channel for communications between the maintenance mobile units scattered along the line and the monitoring and control of base stations; (2) transmission of teletypes between compressor stations and head stations; (3) telegraphic channels between pump stations and head stations; (4) telegraphic channels between storage plants and main stations; (5) transmission of signals for telemetering between metering stations of the gas line; (6) telephonic channels with selective signals between storage stations, main stations and regional divisions; (7) telephonic channels with automatic dialing between compressor and main stations; (8) telephonic channels with automatic dialing between pump stations and main stations; (9) a service channel and telesignaling for the control of radio system failures.

All these communications are destined to bring progress and welfare to Argentina.

END

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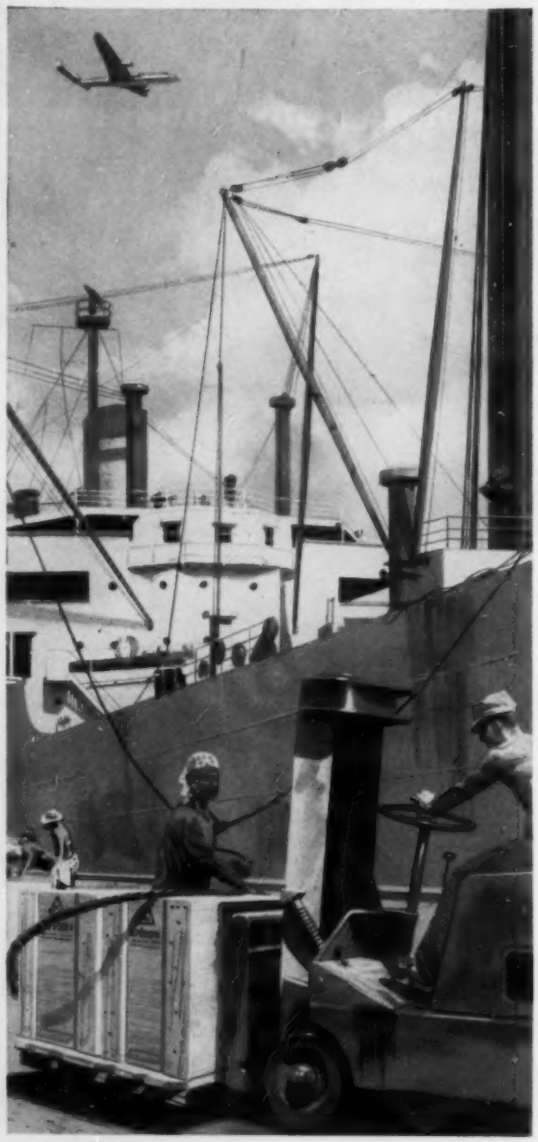

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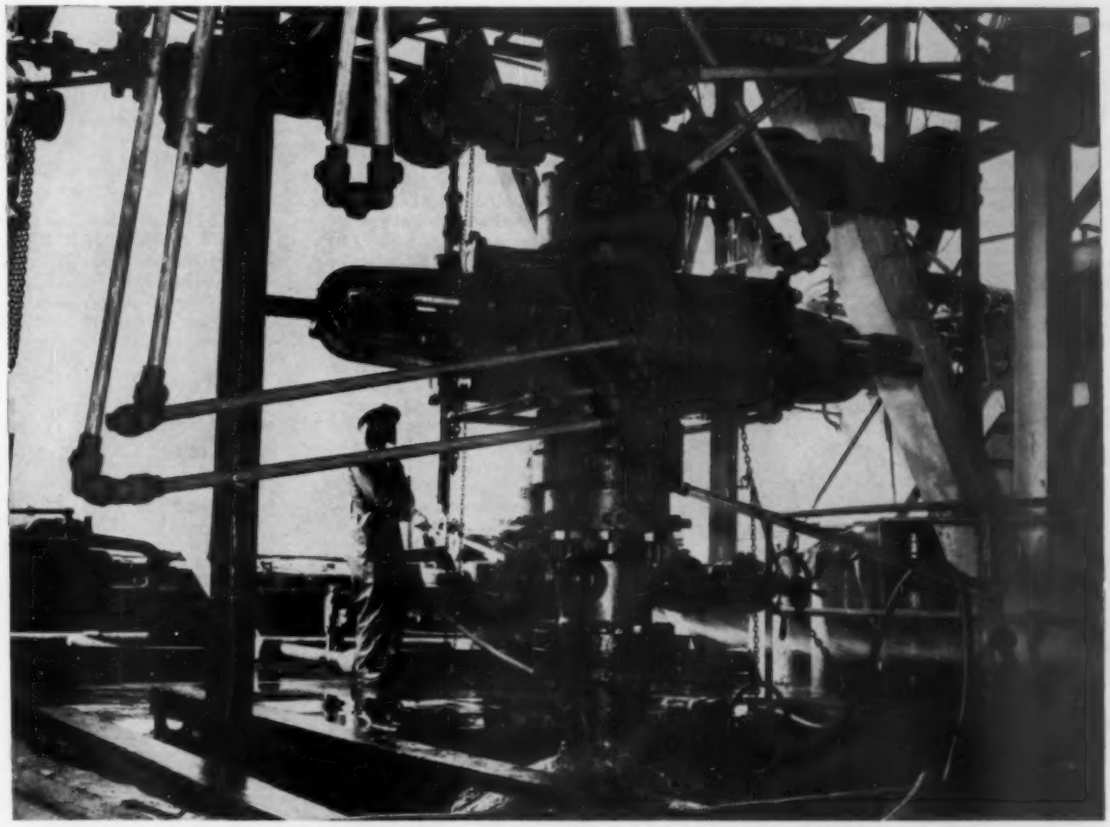
ON BLOWOUT PREVENTER LINES–

Chiksan Swivel Joints insure high safety factor



Chiksan Joints and Weco Unions on blowout preventer lines in offshore operations in Galveston Bay.

Convincing proof that Chiksan Swivel Joints measure up under severe conditions is shown in the following destruction test report: "In open flame trials, Chiksan Swivel Joints, under pressure of 1800 PSI, were subjected to flames reaching 650°F. The Swivel Joints functioned satisfactorily for a full 60 minutes—55 minutes longer than the time deemed necessary for the effective operation of the blowout preventer."

In foul weather and in rough handling Chiksan Joints stand up best. Long service life and minimum maintenance are other major reasons for selecting Chiksan.

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OIL COMPANY STAFF CHANGES

J. Mejia

H. Bird

JORGE MEJIA has been appointed a regional executive of Mobil International Oil Co., with responsibility for Central America, the Pacific Coast nations of South America, and Argentina. **HOWARD BIRD, Jr.**, has been designated Mobil's regional executive for Germany, Holland, and Belgium. Mr. Bird reliquished his responsibilities as a regional executive for Latin America to accept the new post.

WILLIAM R. HORKEY has been elected vice president and general counsel of Helmerich & Payne, Inc., Tulsa. Mr. Horkey has served as the head of the company's legal department since joining the firm in 1955. He is a member of Helmerich & Payne, Inc.'s executive committee and has been a director since 1958. Mr. Horkey is also active in the management of the Company's foreign and domestic subsidiaries and is an officer and director of each. These include Helmerich & Payne, C.A., a contract drilling firm in Venezuela, White Eagle Overseas Oil Co., Inc., now conducting exploratory drilling on its concessions in the Philippines, and Engineering-Construction Co., a distribution pipeline contractor in the United States.

JAMES D. WILLSON has been appointed manager of finance of Tidewater Oil Co. to succeed **RUSSELL D. RICHARDSON**, who recently retired as vice president finance of Tidewater.

CLYDE T. FOSTER has announced his retirement as chairman of Standard Oil Co. of Ohio. He will continue to be a director and will serve in a consulting capacity. The office of chairman will not be filled at this time. Mr. Foster joined Sohio on Feb. 1, 1929, as assistant manager of service stations. He directed the service station expansion program during the 1930's and in 1936 was named assistant to the vice president for marketing. Elected vice president, finance and accounting, and a Sohio director in 1946, he became executive vice president in 1948 and president the following year. He was elected chairman on April 30, 1956.

SAM F. SHAKELY, Oklahoma City, has been named manager of production for Anderson-Prichard Oil Corp. He will work directly with Dr. R. W. Brauchli, vice president of exploration and production. Mr. Shakely joined APCO in 1948 as general superintendent. He had spent eleven years with Carter Oil Co. prior to joining APCO.

RUSSELL D. RICHARDSON, vice president-finance, Tidewater Oil Co., has retired after 39 years in the oil industry. He joined Tidewater in 1921 as an accounting clerk at the company's Avon refinery in the San Francisco Bay area. He was named vice president-finance in 1958.

WILLIAM F. BROWN, Denver, Colo., has been promoted to special assistant to Harold G. Osborn, senior vice president of Continental Oil Co. Formerly manager of manufacturing for Conoco's Rocky Mountain region, he will make his new headquarters in Houston.

LAWRENCE C. FORD has been appointed president of California Shipping Co. subsidiary which manages the Standard Oil Co. of California's worldwide marine operations. The new head of Standard's extensive seagoing and inland fleets succeeds **A. E. KIHN,** who retired May 31st on reaching the company's normal retirement age. Mr. Kihn served nearly 50 years with the Standard marine organization and headed it for the past 11 years.

C. B. Marshall

L. W. Leath

CLIFFORD B. MARSHALL has been elected executive vice-president of Standard-Vacuum Oil Co. He is the first to carry this title in Stanvac's history. A director since 1949 and a vice-president for eight years, he also has been serving as vice-chairman of the executive committee.

RICHARD R. ANDERSON has been appointed director of production for Sun Oil Co. He was formerly an administrative assistant to the production vice president and succeeds Kingsley V. Schroeder, who recently was named vice president in charge of domestic and Canadian production activities. Also announced were the appointments of **J. DWAYNE TAYLOR** as assistant to the director of foreign production operations, and **THOMAS F. RITTER,** as assistant to the geological counselor for foreign operations. Both will be located at Philadelphia. Mr. Taylor was formerly assistant regional geologist for Venezuelan Sun Oil Co. at Caracas, and Mr. Ritter was formerly district geologist for Bolivian Sun Oil Co. at Cochabamba, Bolivia.

B. L. RAY, a former vice president and member of the board of management of the Esso Standard division, Humble Oil & Refining Co., has retired after 40 years service. Mr. Ray was elected a director of Esso Standard Oil Co., now part of Humble, in 1952. He became general manager of marketing and head of Esso's marketing department in 1954, and was elected a vice president and member of the Executive Committee of the Esso board a year later.

O. S. MINGUS, president of the Lago Oil and Transport Co., a subsidiary of Standard Oil of New Jersey, has been awarded a medal of merit for his contributions to the development of the island of Aruba in the Netherlands West Indies. The award will be made on July 4 by *The Echo of Aruba,* an economic publication.

JOHN C. THOMPSON, 49, has been named comptroller of Mobil Oil Co. de Venezuela, succeeding George J. Schultze, who has returned to Mobil International Oil Co. in New York. Mr. Thompson is a veteran of 33 years with Mobil and its predecessor companies.

REESE H. TUCKER of Bartlesville, Okla., has been elected a vice president of Cities Service Co. at New York and will serve as coordinator of exploration and production for the Cities Service system. Mr. Tucker joined the Cities Service organization in 1930, and was named chief geophysicist for Cities Service Oil Co. in 1948. Subsequently he was elected a vice president and director of this subsidiary, and in recent years traveled extensively in foreign and domestic areas in connection with Cities Service exploration and production activities.

L. C. Ford

R. Tucker

STANLEY G. HARDISON has been appointed Southwestern region exploration manager for Lion Oil Co. With headquarters in Midland, Tex., he will direct exploration activities of the Midland, Amarillo, and Oklahoma City districts. Mr. Hardison was formerly a geologist with Kerr-McGee Industries in the West Texas and Panhandle areas. For the past year he has been a consulting geologist in Amarillo.

P. L. VANLUE has been elected treasurer, controller and assistant secretary of Oasis Oil of Libya. **E. A. GRAHAM** and L. F. Willhite have been elected assistant treasurers and assistant controllers of The Oasis Oil Co. of Libya.

LOUIS W. LEATH, formerly vice president, Sinclair Oil Corp., has been elected president of Sinclair and BP Sales, Inc. He succeeds Carl G. Drescher, who has been president of the Sinclair and BP marketing organization since it was formed in March of 1959. Mr. Drescher is returning to Sinclair Oil Corp. as vice president.

JOHN RICCA, formerly general purchasing agent for Arabian American Oil Co. and Aramco Overseas Co., has been appointed manager of purchasing and traffic for The Oasis Oil Co. of Libya, a wholly owned subsidiary of The Ohio Oil Co. Mr. Ricca, who joined the company May 16, will spend several weeks at Ohio Oil's general office in Findlay, Ohio, before leaving for Tripoli, Libya, Oasis Oil's headquarters.

L. D. STINEBOWER has been elected treasurer of Standard Oil Co. (New Jersey), succeeding **E. G. COLLADO** who was elected a director last week. Mr. Stinebower has served, since April 1, 1959, as executive assistant to the chairman of the board. At the same time the company announced the appointment of **D. E. STINES** as executive assistant to Leo D. Welch, recently elected chairman of the Jersey board.

D. E. Stines

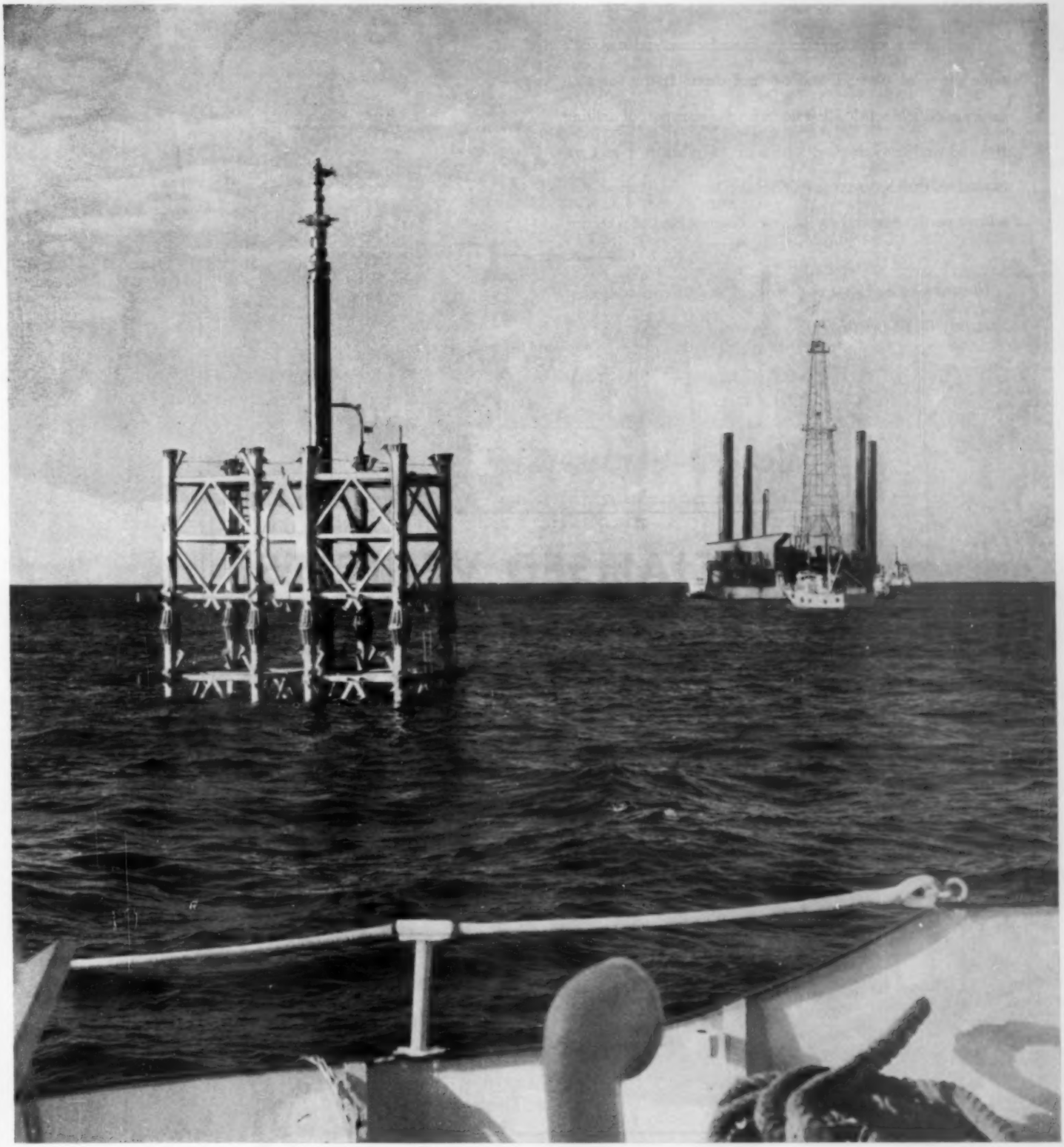
G. Owen

GARRY OWEN, a vice president of Arabian American Oil Co. has been elected a director. He has been with Aramco since 1941. Prior to joining Aramco he practiced law for 12 years in San Francisco and joined Standard Oil Co. of Calif. in 1939. He is now stationed in Washington, D. C., where he is in charge of government relations affairs for Aramco in the United States.

DAVID J. JONES has been appointed manager of a newly formed investment analysis department which will provide continuing analytical study of capital expenditure and investment programs of Standard Oil Co. (N.J.) and its affiliates. Mr. Jones, assistant treasurer of Jersey Standard since 1957, joined the treasurer's department of the company in 1947 specializing in Middle and Far East areas. He has since served as assistant treasurer of Esso Export Corp., deputy European financial advisor for Jersey, and financial manager of Esso France.

THOMAS M. WELCH, manager of the plan development and social security division of Esso Standard Oil Co. has transferred to Houston to assume similar duties with Humble Oil & Refining Co.

STANLEY W. FADDEN has retired from Mobil International Oil Co. He joined the company in 1927 and went to Java as an all-products salesman. He spent 18 years in the Far East marketing operations. In 1945 he returned to New York as operations and district manager of the West Africa division. His most recent assignment was with the market research department of Mobil International.



ABU DHABI

A well head on the Persian Gulf. In the background, the barge "Adma Enterprise" which is currently drilling beneath the waters of the Gulf. The results are sufficiently encouraging to warrant the preparation of facilities for regular production. This stage should be reached by mid-1962.

BP

The Thornycroft Organisation manufacture and market a wide range of 4-wheel and 6-wheel drive chassis for such duties as oilfield self-loading floats for the transport of drilling rigs and well servicing hoists, or as cargo trucks, pipe carriers, explosive trucks, water carriers, also for exploration and seismic parties penetrating into the roughest kind of territory.

Illustrated are examples of medium and heavy duty trucks operating in The Persian Gulf Area and the Argentine.

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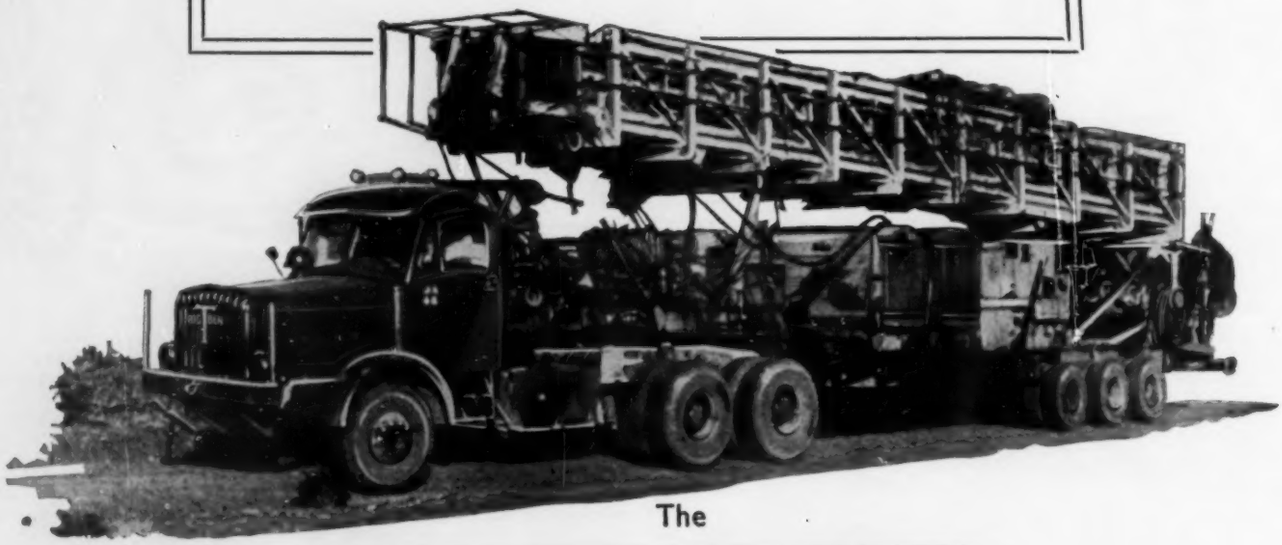

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RESTRICTED WATER FLOODING	**FLUDEX*** *Water Flood Additives* prevent deposition of scale, disperse formation-plugging materials, inhibit corrosion, act as wetting agents and water clarifiers. For application to pumping wells, water flood and disposal wells; also for backwashing input wells and filters. Many formulas to meet special needs.
PARAFFIN ACCUMULATION	**SOLVO*** *Paraffin Removers* prevent deposition of wax, paraffin, bitumen; remove such accumulations from sucker rods, well tubing, flow lines, tanks. Contain no chlorinated solvents.
SCALE DEPOSITION	**S. P.*** *Scale Preventives* prevent deposition of troublesome oil-field scales such as carbonates and sulfates of calcium, magnesium, strontium and barium on well pumps, tubing, liners, flow lines, heating and water circulating systems.

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Petrochemical Growth in Argentina

(*Continued from page 84*)

Ducilo in Berazategui and Sniafa near San Nicolas.

Atanor has also announced its intention to increase its methyl alcohol plant to 12,000 tons per year and shift from charcoal to natural gas for its production of raw materials. This company is interested in the production of acetone and its combination with Hooker for the production of phenol may include acetone among its "other chemicals".

Electroclor, owned jointly by Duperial (I.C.I.) and Celulosa Argentina (Italian group Pomiglio), has announced it will enlarge its ammonia plant in Juan Ortiz near San Lorenzo in the state of Santa Fé to 20,000 tons per year and will shift to natural gas for its requirements. Celulosa is at present enlarging its plants and Dr. Pomiglio in person is in Argentina directing the projects.

Fabricaciones Militares is leasing its chemical plants to private companies and it announced to shift its ammonia plant in Cordoba from charcoal to natural gas.

Pechiney, through its subsidiaries Indupa (manufacturers of chlorine and caustic soda) and Andina Metalurgica (manufacturers of calcium carbide), has made differing announcements during the last few years of intentions to enter petrochemicals in Argentina. Engineering work on the vinyl-chloride and polymerization plants are well advanced. No definite steps have been announced.

Union Carbide, through a subsidiary which manufactures plastic materials from U.C.C. products, has been surveying the local market and conditions for the erection of petrochemical plants.

A number of American and European chemical companies have made studies of local conditions relating to the utilization of Argentine resources of hydrocarbons for the manufacture of petrochemicals, but no projects have materialized so far.

The writer believes that some of the reasons for the slowdown in projects and plans of companies interested in the manufacture of chemicals from the hydrocarbon resources of Argentina (estimated at 600 million cubic meters of crude oil in July 1959) are to be found in: 1) uncertainty about the political and social conditions of the country. Too many political parties, sabotage against the Government, and labor unrest—and "communists" and "Peronistas" in key positions in labor unions, some government agencies and educational centers. 2) rather frequent changes of policy on taxation, import duties on equipment and raw materials for building of new plants or expanding existing ones, and on protective measures of established industires. 3) difficulties in obtaining credits for financing local investments in Argentine pesos.

The Federal government is aware of these and other drawbacks to inducing foreign companies to invest in industrial plants in Argentina and is fighting hard to create an encouraging climate for a free competitive market without governmental interference. Much success has been accomplished since the second half of 1959 and it is expected that things will be under control before the end of 1960.

Under favorable conditions, Argentina has everything needed for developing petrochemical industry that may compete with its products in the international market and become an important factor in the country's economic balance. END

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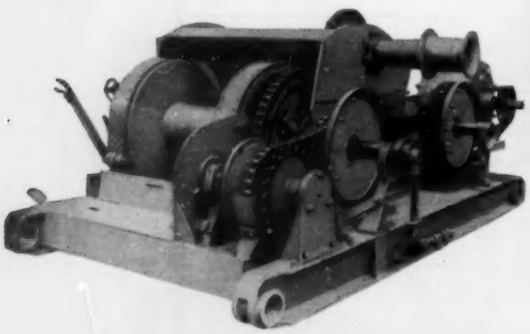
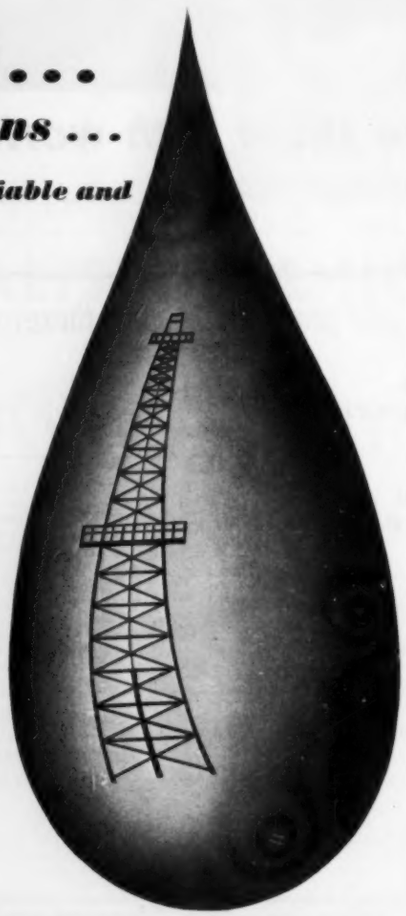
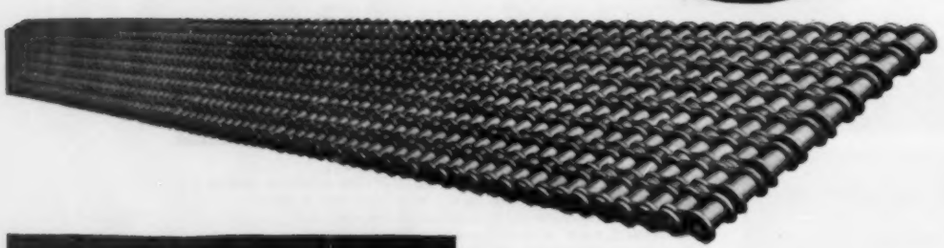
Renold ASA series chains are available throughout the world from ·625″ to 2·5″ pitch in single and multiple strand widths and are backed by the production resources and know-how of the world's largest manufacturers of precision roller chain.
They are fitted as original equipment by Ideco-Woodfield, Armstrong Whitworth, and on National Supply draw-works manufactured in Great Britain by The Oil Well Engineering Co. Ltd.







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A new Dowell cementing unit showing the operator's deck-control position. Dry cement and admixtures are fed through air lines from the transport to the paddle-type slurry mixer, positioned at ground level at the rear of the cementing unit. The bulk cement tanks on the transport have capacities of 300 sacks each.

Heads S.I.E. Marketing

Southwestern Industrial Electronics Co., one of the Dresser Industries, has appointed Robert O. Vaughan as vice president, marketing. He was formerly western regional manager of government operations for Dresser Industries, Inc.

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Routine maintenance is done at ground level. When the samson post-ladder is used, a welded and braced safety loop supports the mechanic.

With every wanted feature indicated by composite opinion, these new *Century* Pumping Units set new standards—in ease of maintenance as well as in performance.

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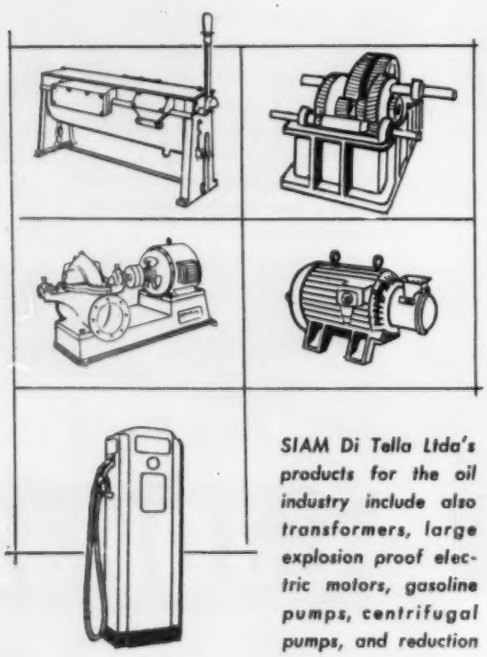
SIAM Di Tella Ltda., the vast Argentine organization which this year celebrates its fiftieth anniversary, has now 12 plants in full activity producing more than 250 different articles. It has long been providing equipment for the extraction of oil, one of Argentina's most important natural resources. To date it has manufactured more than 2.600 oil well pumping units of 7 and 11 tons. SIAM Di Tella Ltda. is a dynamic Argentine enterprise with many important connections in the U.S.A. - Westinghouse Electric International Company, The Baldwin - Lima - Hamilton Corporation, United Engineering and Foundry Company, Hewitt Robins Co. and others including its purchasing agents and representatives, the Di Tella Corporation of 405 Lexington Avenue, New York, N.Y.



SIAM Di Tella Ltda's products for the oil industry include also transformers, large explosion proof electric motors, gasoline pumps, centrifugal pumps, and reduction gears.

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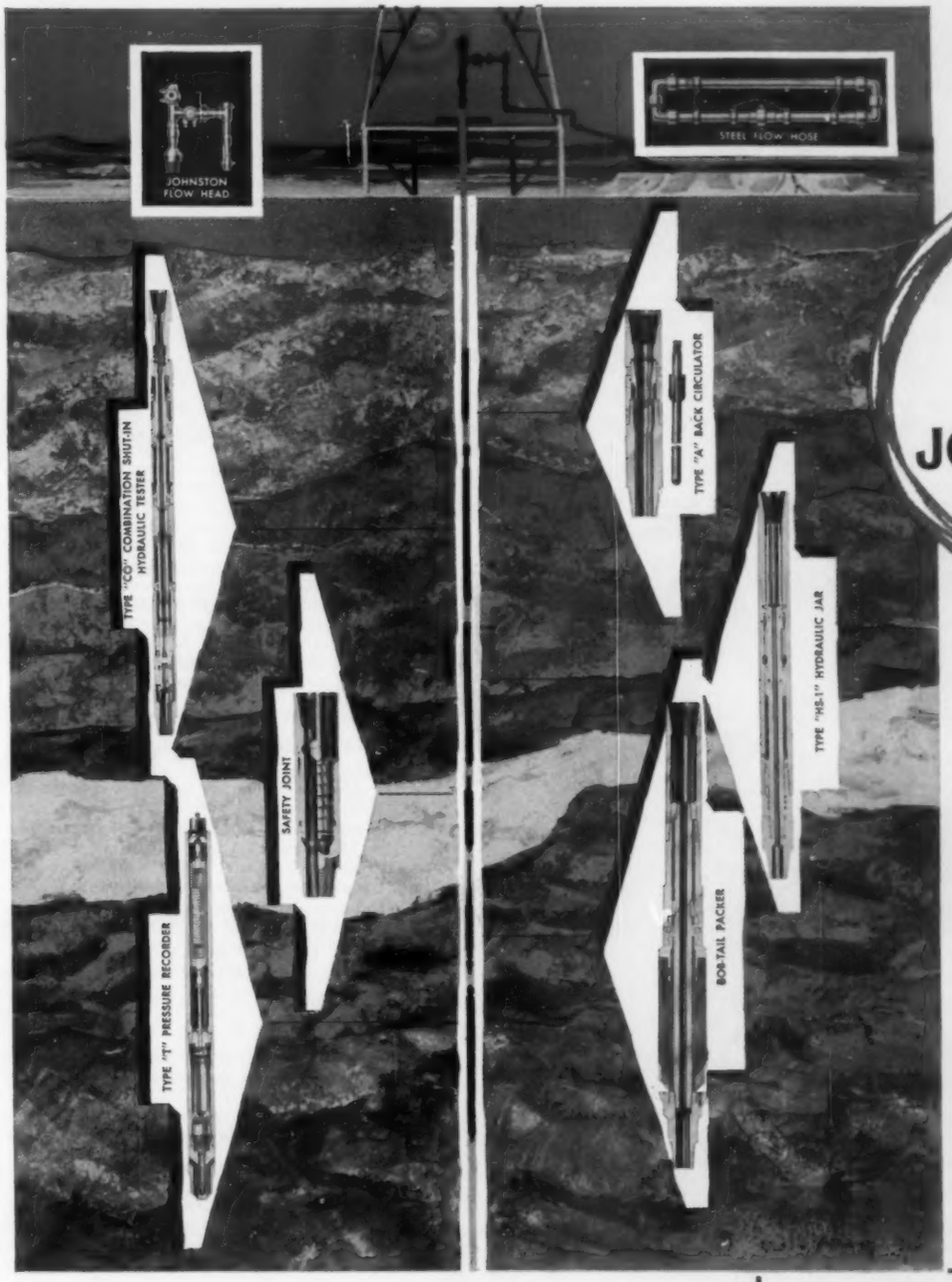

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ENI Reports In All Sectors

For the year ending April 1959, ENI's net profit was Lit. 4.6 billion (12.5% of endowment fund). By law, 60% of profit must go to the treasury, 20% to reserves, 15% to research and development. All direct taxes (treasury and local) by ENI in 1958 amounted to Lit. 5.4 billion, and indirect (manufacturing, natural-gas, customs, etc.) to 67.7 billion. During 1958 amortization took Lit. 28.4 billion, and third-party interest and dividends 18.6 billion.

In 1958, ENI natural-gas production amounted to 4.8 billion cubic meters, 2.9% over 1957, and in the first four months of 1959 rose another 9%. Two important gas discoveries were reported in 1959: (1) at Spilamberto (Modena); (2) at Ferrandina (Matera). Due to crude production at Gela fields, liquid-hydrocarbon production rose to 345,406 tons in 1958, 50% over 1957.

Production in Egyptian fields by ENI's associate COPE (Agip Mineraria) was 1,802,896 tons in 1958, a 137% rise over 1957; and registered another rise of 26.5% in the first four months of 1959. In 1959, 1,124,884 tons of Egyptian crude arrived in Italy.

Agip and other ENI affiliates in July 1958 set up a joint company (⅓ Italian, ⅔ Moroccan) for onshore and offshore Moroccan lands in Tarfaya province covering 35,000 square kilometers. Drilling is to begin during 1960. A joint company similar to the Moroccan and Iranian ones was signed with the Sudan in August 1959 for 8,500 square kilometers onshore and offshore. Drilling began in the Persian Gulf in September 1959 upon completion of a platform for the first under-water well.

Eni's natural-gas and town-gas pipeline network was 5,049 kilometers long at year-end 1958. Petrochemical use of gas in 1958 accounted for over 63.3%, and civilian use rose to over 21.4% of total.

ENI has decided to join the building of a 1,100-km line to link Genoa with the Po Valley, Switzerland, and South Germany—to carry yearly between 12 and 14 million tons of crude and products. It is to be built partly by Oleodotti Internationali-OI (in which SNAM holds 66.5%) and partly by Sudoel AG fur Erdoelwirtschaft (in which OI has a half-interest).

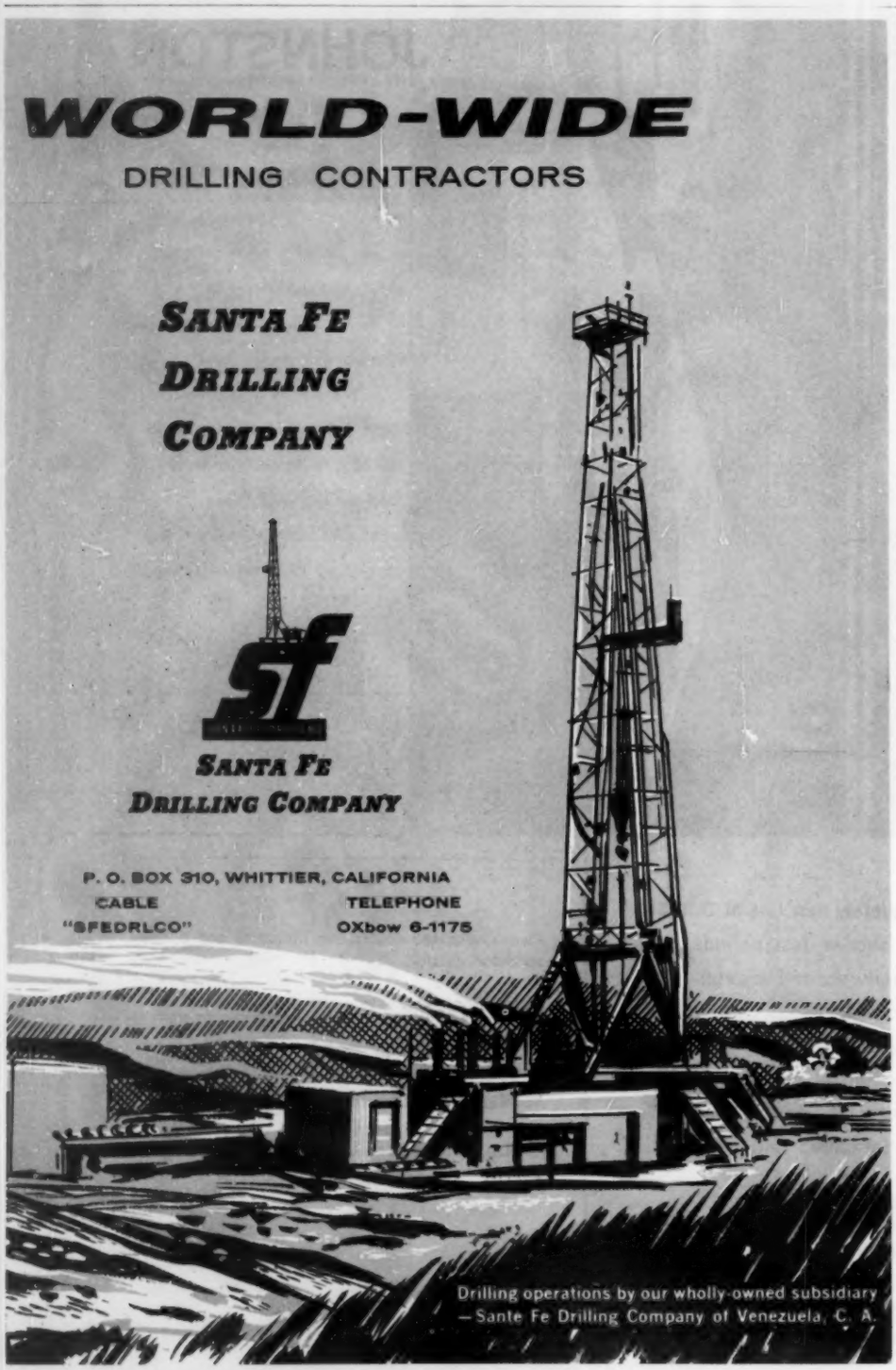
Crude and products carried by ENI's tankers in 1958 rose 26.9% over 1957. Added to the fleet were two 36,182-ton turbine tankers and a 738-ton motor vessel for LPGas transport.

ENI's affiliates processed 5,667,400 tons of feed stock in 1958—3.5% over 1957. To be built at Aigle (Switzerland) is a two-million-ton-per-year refinery, and in Morocco a 1,250,000-ton plant.

ENI's marketing expansion in 1958 included a number of motels in Italy, and service stations in Libya, Eritrea, Somalia, and Ethiopia. Product sales abroad rose about 50%.

Sections of the ANIC petrochemical complex have gone onstream as scheduled; and, when construction is complete, annual production should be a million tons of fertilizer and 70,000 tons of rubber.

In November 1958 building began on the Latina nuclear power plant by a group associated with Agip Nucleare.



Ultramar to Refine in Newfoundland

Ultramar Co., which recently acquired Panama Refining & Petrochemical Co. by purchase and its refining subsidiary, Golden Eagle Refining Co., has formed a wholly-owned company, Golden Eagle Refining Co. of Canada, to carry on petroleum refining and marketing in eastern Canada. This new subsidiary has signed an agreement with the government of Newfoundland to build a refinery at St. Johns, with an initial capacity of at least 5,000 b/d, the first refinery in the province. It is reported that under this agreement the Newfoundland government has undertaken to purchase certain products for a 20-year period.

Laid-Up Tankers

After a decline in the gross tonnage of laid-up tankers over the period from November 1959 to February 1960, the world total rose again over March to May, according to details issued by the Chamber of Shipping of the United Kingdom compiled from information received at Lloyd's. This applies equally to British-flag vessels but for American there was continued decline, as shown by the following figures:

Laid-up Tankers in 1,000 Gross Tons

1960	*World*	*British*	*United States*
March	3,160	560	382
April	3,335	676	376
May	3,350	660	366

The totals are for the beginning of each month and exclude coastal or short-voyage tankers.

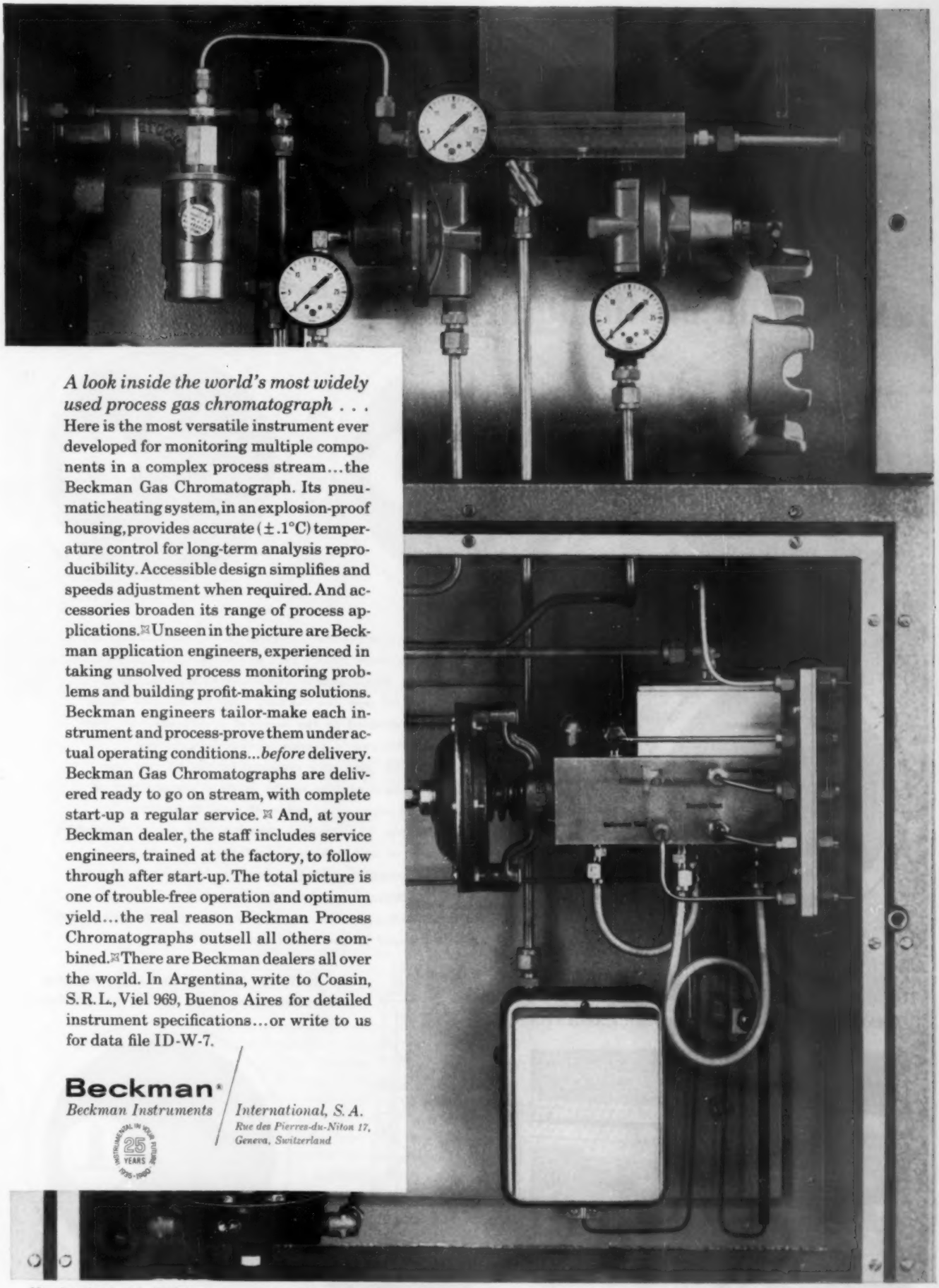
Mobile Platform for Venezuela

The first tender-assisted, mobile, drilling platform to work in Lake Maracaibo will soon go into operation by Loffland Brothers Co., Tulsa, for Mene Grande Oil Co. The three-legged Letorneau platform, which can be used in water 105 feet deep, will operate with one of Loffland's tenders now in Venezuela. The multi-purpose unit can be used for stratographic survey, exploration and production drilling and workover.

British Petroleum Earnings

In the June issue of WORLD PETROLEUM a tabulation was given showing certain salient figures from 1958 and 1959 annual reports of 40 oil companies. In the case of British Petroleum Co. the figures shown were for British Petroleum Co. Ltd. and not the consolidated figures for the BP Group including most of the subsidiaries. Based on consolidated accounts the following figures have been supplied to the editors by the company:

	1959	1958
	Millions of Dollars	
Gross Income	$2,451.1	$2,371.2
Depreciation etc.	130.4	135.9
Net Income	177.4	176.3
Cash Earnings	307.8	312.2
Capital Expenditures	394.1	385.0
Cash Div. Comm. Stock	63.8	49.6
Net Worth	1,307.0	1,111.3
No. Comm. Shares (millions)	210.2	202.4
Net Income per share	$0.84	$0.87
Net Income as % of Gross	7.2%	7.4%
Net Income as % of Net Worth	13.6%	15.9%



A look inside the world's most widely used process gas chromatograph . . .
Here is the most versatile instrument ever developed for monitoring multiple components in a complex process stream... the Beckman Gas Chromatograph. Its pneumatic heating system, in an explosion-proof housing, provides accurate (±.1°C) temperature control for long-term analysis reproducibility. Accessible design simplifies and speeds adjustment when required. And accessories broaden its range of process applications. Unseen in the picture are Beckman application engineers, experienced in taking unsolved process monitoring problems and building profit-making solutions. Beckman engineers tailor-make each instrument and process-prove them under actual operating conditions... *before* delivery. Beckman Gas Chromatographs are delivered ready to go on stream, with complete start-up a regular service. And, at your Beckman dealer, the staff includes service engineers, trained at the factory, to follow through after start-up. The total picture is one of trouble-free operation and optimum yield... the real reason Beckman Process Chromatographs outsell all others combined. There are Beckman dealers all over the world. In Argentina, write to Coasin, S.R.L., Viel 969, Buenos Aires for detailed instrument specifications... or write to us for data file ID-W-7.

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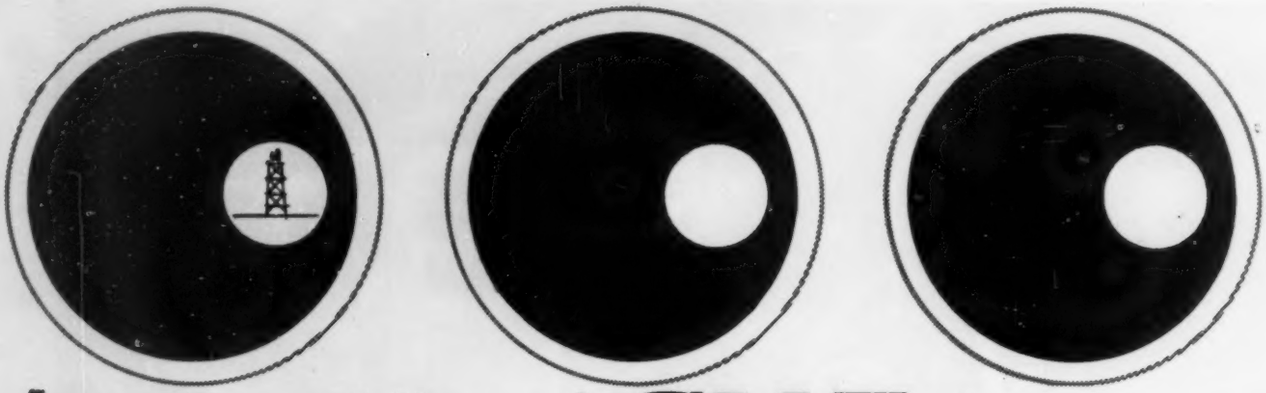
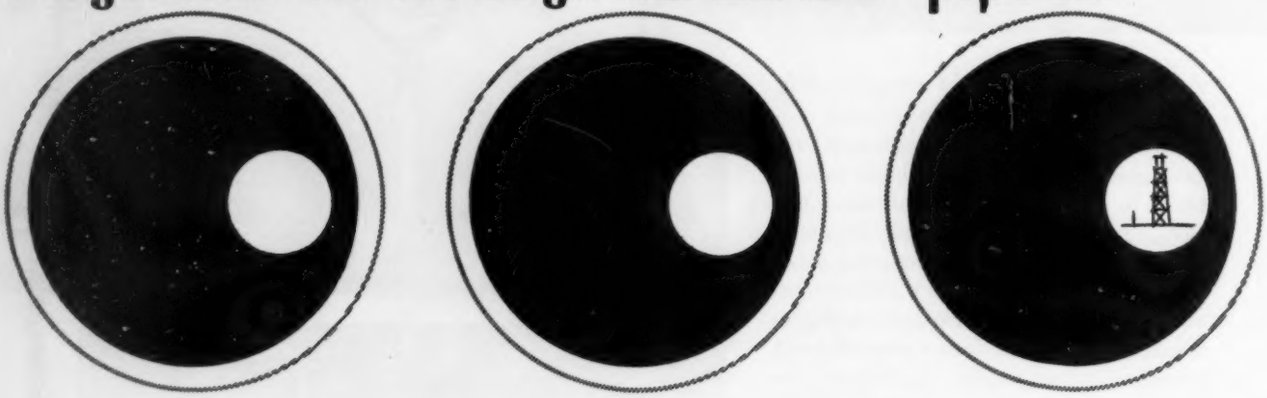
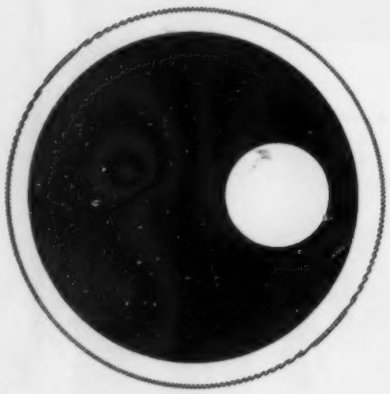


Argentine oil through SIAT pipes...

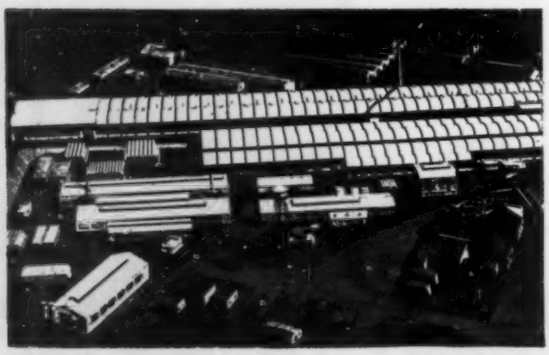




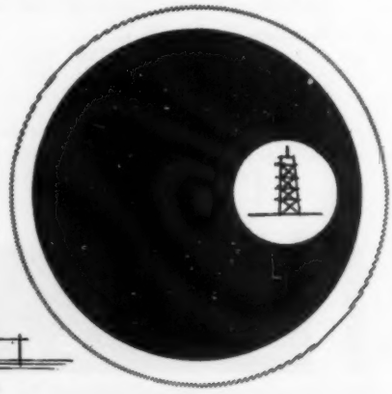
The year 1959 saw a tremendous upsurge in the development of Argentina's oil resources. SIAT's part in this development programme has been of prime importance to the country: notably, 900 kilometers of the oil pipe line running from the extreme north to the distilleries situated on the banks of the Paraná river were produced in the Company's Buenos Aires mill; a further 625 kilometers of 14" pipe were produced for the oil pipe line constructed for Esso Argentina in the south of the province of Buenos Aires, and many other orders of lesser importance were also completed. The company, which is now one of the world's biggest producers of high quality large-diameter pipe to A.P.I. standards, is at present doubling its capacity for producing oil and gas pipe line. Additional machinery for this purpose has been acquired in the U.S.A. and its cost is being financed through a credit of $ 1.700.000 granted by the Export Bank of Washington.

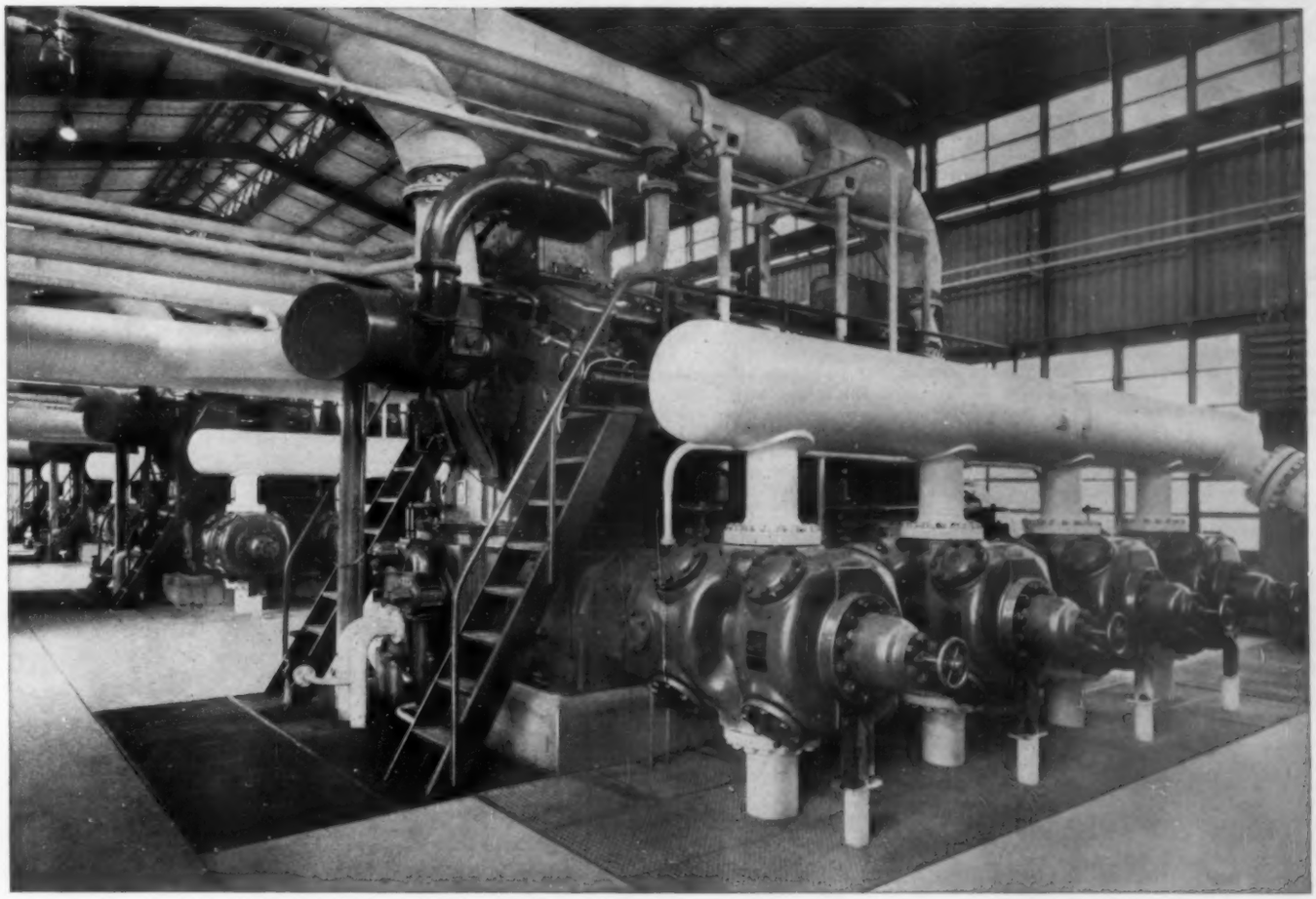
SIAT

MAIPU 39, BUENOS AIRES, REPUBLICA ARGENTINA



SIAT. An Argentine industry competing successfully with the world's best producers





KVS gas-engine compressors put the "push" in new French pipeline

From the rich Lacq fields just north of the Pyrenees, natural gas is flowing through the new Gaz de France pipeline system to the industries of Paris and other parts of France.

Four of the five compressor stations along the line will employ Ingersoll-Rand KVS turbocharged gas-engine compressors. At the Chazelles station, first in operation, the four 2000-hp KVS units shown above boost gas to 967 psi, with a fifth to be added shortly. In addition, three KVS engine-compressors will be installed at each of the new stations at St. Benoit du Sault, Montlucon, and Vindecy.

The 4-cycle V-angle KVS is ideally suited to this type of service, with its exceptional stability of operation. Efficient, trouble-free compression is assured by I-R compressor cylinders with gas-cushioned Channel Valves, known around the world for long life with minimum attention.

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INTERNATIONAL NEWS AND NOTES

Aden—Petroleum Concessions Ltd. (IPC) has decided to abandon exploration in the Thamud area following a breakdown in the discussions between company representatives and the Quaiti and Kathiri sultanates in the Aden protectorate. Geological and seismic surveys had shown the area to be worthy of further exploration by drilling, but the terms demanded for a concession were found unacceptable. Both states now intend to invite international tenders for the Thamud area.

Australia—"Australian oil refining companies have refused to buy Russian crude because the Soviet Union does not have a very impressive record of assuring continuity of supply" was the observation of D. M. Pilcher, director of Australian Petroleum Information Bureau after the recent unsuccessful visit to Melbourne of I. I. Federov, director of Soviet Export Commission.

Australia—With Phillips as operator, Phillips Petroleum and Sunray Mid-Continent Oil Co. will begin a 27,520,000-acre seismic survey for themselves and Australian associates in western Queensland, adjacent to the Northern Territory—with an option to drill to earn a full interest in a preselected one-half of the acreage. Lying within the Great Artesian Basin, the acreage increases Phillips-Sunray holdings in the basin to 68.8 million gross acres. Acreage earned by drilling will be owned 50-50 by Phillips-Sunray. Australian associates include Apinaipa Petroleum Co., Ltd., Associated Australian Oil Fields, and Associated Preney Oil Fields.

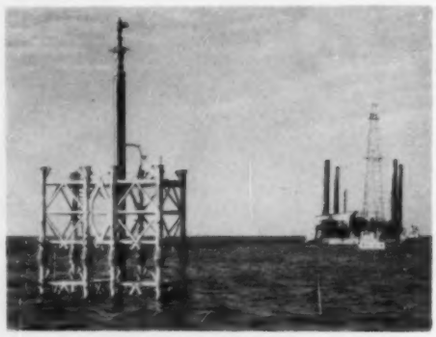
Australia—The site of the 100,000 ton/yr lubricating oil refinery which British Petroleum is to build in Australia at cost of £8.5 million has been announced as Kwinana. It will be adjacent to the BP refinery, which since 1955 has been producing a full range of refined products with the exception of lubricating oils. Construction is expected to start this year, with commissioning due in 1963.

Canada—Shell Oil Co. of Canada is considering building a third refinery in Canada. This would be in Alberta, southeast of Calgary, where the purchase of a 310-acre tract of land is under consideration for which an industrial development permit has been secured. Plant capacity will depend on marketing developments by the time construction can be started, but the plan is primarily to make automotive and domestic fuels for the Alberta market.

Canada—Imperial Oil Ltd.'s net earnings in the first quarter of 1960 at $15,705,000 ran 16% higher than in the like period of 1959.

J. R. White, has become Imperial's board chairman, and has been succeeded as president by William O. Twaits. Mr. White's designation as chairman is temporary; he will relinquish his post and his directorship about July 1 to become a director of Standard Oil Co. (New Jersey) which owns about 70% of Imperial's capital stock. At that time V. S. Simmons, now general manager of manufacturing, will replace Mr. White.

Colombia—Official report for 1959 indicates 201 wells were drilled during the year, with total footage of 1,140,522; wells drilled during 1958 totaled 169, with footage at 963,504. Exploratory operations during 1959 by Texas Petroleum Co. opened two new fields, Baul and Magdalene; Shell Condor discovered Crystalina; International Petroleum opened the Cachira field; and Colombian Petroleum Co. found oil in Zenon-1.



Drilling barge "Adma Enterprise" is towed away from the well head leaving Umm Shaif No. 3 well with its tower isolated in the empty expanse of the Persian Gulf (BP photo).

Das Island—Three wells on the Umm Shaif structure east of Das Island have now been completed from the drilling barge "Adma Enterprise" by Abu Dhabi Marine Areas Ltd., two-thirds owned by British Petroleum; and a fourth is drilling. No. 1 found oil in the Thammama formation at about 5,500 ft; No. 2 was disappointing; but No. 3 again found oil, at around 9,600 ft, in the Araej zone which is considered to justify preparing for commercial production. This will involve laying a 20-mile submarine pipeline to Das Island, installing gas-oil separators and tankage, and building a tanker loading jetty. This work will take about two years.

Steel "protection towers" fabricated by British Engineering Co. Ltd., of Tipton (Staffs.), have been installed around the wells. These are of all-welded tubular construction and contain up to 230 tons of steel. A high welding standard was called for in fabrication, with general structure tolerances 1/16-in., and all flanges on main joints in line to 1/32-in. This was done under Lloyd's supervision, and practically all welding plant was supplied by Quasi Arc Ltd. The high standard necessitated the use of steel master templates and jigs, exceptional care in heat distribution and welding sequence, and mounting the large lower section—measuring 56 ft by 12 ft 6 in. and weighing 35 tons—in special manipulators.

France—French Minister of Industry Jeanneney has expressed the wish of his government that France's oil-products market be divided equally with two or more French firms on the one hand and all the major international companies on the other. There is no desire to squeeze out the latter, and sales volume of the international majors will not decline, according to Jeanneney. "It should rise along with French consumption, but the French companies must grow faster."

France—Four French drilling companies have pooled their efforts into Ste. Francafor, 39 rue du Colisee, Paris, a new firm which will undertake technical and commercial surveys, negotiations, and prospecting jobs and research for the benefit of all four or any one of the founders. The new firm is an effort to branch out into countries such as Spain, Portugal, Italy, Yugoslavia, Greece, Turkey, Lebanon, United Arab Republic, Libya, Morocco, and Tunisia.

France—The new State marketing company, Union Generale des Petroles, has the following participants: Regie Autonome des Petroles 35%; SN Repal 30%; four other State companies 35%. The latter are Cie. d'Exploration Petroliere (CEP); Ste. des Petroles d'Afrique Equatoriale (SPAFE); Ste. de Production e d'Exploitation Petroliere en Alsace (PREPA); and Ste. Nationale des Petroles d'Aquitaine. The UGP will form a new company in which it will hold 60% and Caltex SAF 40% to operate the refinery, the tanker fleet, and the marketing network which was bought from Caltex SAF.

French Sahara—The French government-controlled SNPA has found oil in a new well 17 miles southwest of its previous Hassi el Gassi discovery. No. 2 El

(*Continued on page* 106)

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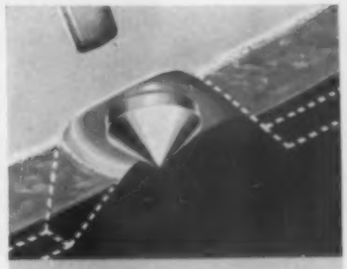

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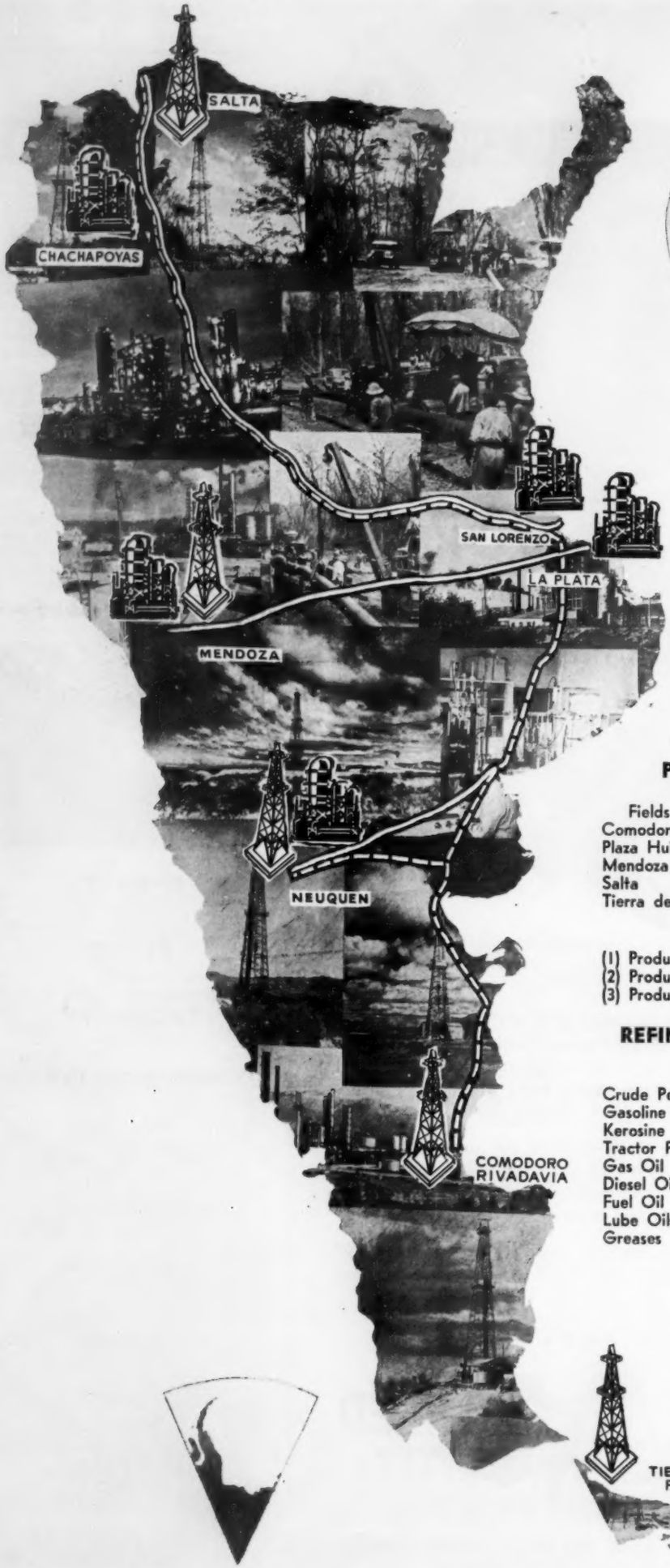


YPF

OIL AND GAS PIPELINES
(Lines Constructed During 1960)

Campo Durán-San Lorenzo Oil Pipeline

Length:	914 miles
Capacity:	57,868 barrels daily
Diameter:	12¾ inches

Campo Durán-Buenos Aires Gas Pipeline

Length:	1,083 miles
Capacity:	247,170,000 cubic feet daily
Diameter:	24 and 22 inches

PRODUCTION OF PETROLEUM
(1959)

Fields	Barrels
Comodoro Rivadavia	20,439,901 (1)
Plaza Huincul	6,257,078
Mendoza	11,131,532 (2)
Salta	2,759,397
Tierra del Fuego	7,831 (3)
Total	40,595,739
(1) Production by Contractors to YPF:	673,520
(2) Production by Contractors to YPF:	1,381,450
(3) Production by Contractors to YPF:	1,887

REFINING OF PETROLEUM PRODUCTS
(1959)

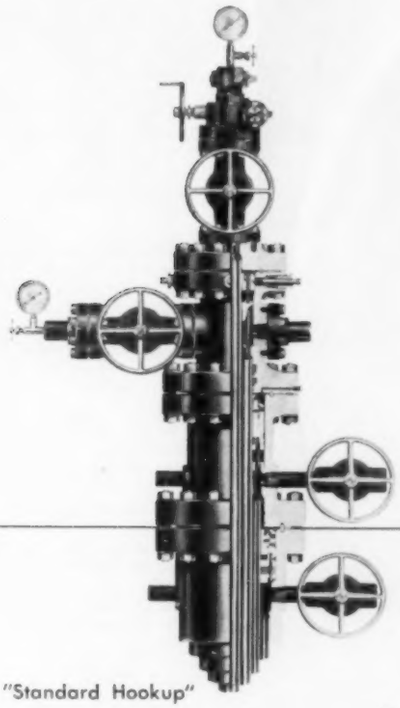
	Barrels
Crude Petroleum Processed	47,327,658
Gasoline	8,811,013
Kerosine	4,407,969
Tractor Fuel	665,695
Gas Oil	1,852,845
Diesel Oil	4,418,429
Fuel Oil	23,457,460
Lube Oils	516,402
Greases	24,644

YACIMIENTOS PETROLÍFEROS FISCALES

Argentine Government Oilfields

PERFORMANCE AND ECONOMY

for everyday production needs
are built into the
O-C-T "Standard Tree" and
Low Pressure Equipment



O-C-T "Standard Hookup"

C-18-H Casing Head with
T-H-S Flanged Bottom Tubing Head

C-M-T Casing Head and
T-H-S Tubing Head

While the Oil Center Tool Company is noted world-wide for dual production equipment and high pressure trees, the truth of the matter is many completions require what might be called "standard equipment." O-C-T is noted for this, too.

The "Standard Tree" is simply the combination of an O-C-T casing head, O-C-T tubing head, master valve of your choice, and an O-C-T flow control.

Simplicity is a basic part of the standard's makeup.

The new series of O-C-T low pressure equipment combines simplicity and flexibility. Tubing stripper can be used in combination with other equipment if desired, without the necessity for adding stripper housing or bowl. Threaded tubing hangers are available for use with or without the stripper.

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COMODORO RIVADAVIA - BARILOCHE - ESQUEL - ADROGUE

(*Continued from page* 102)

Agreb well tested between 44 bbl and 337 bbl per hour of crude in three successive tests at 10,075 ft to 10,285 ft.

Germany—Erdolchemie GmbH is commissioning the second stage of its new petrochemical plant at Dormagen near Cologne, whose first units were brought in during 1959. The new units are a cracking and gas separation plant designed to treble the previous output of ethylene, an ethanol unit, and a second plant for producing ethylene oxide. One of the recent new units already commissioned successfully, a hydrotreater, is believed to be the first commercial sized one of its type for treating steam-cracked gasoline. Erdolchemie is owned equally by BP's German associate and Farbenfabriken Bayer AG.

Greece—BP Exploration Co. (Greece) Ltd., has been formed to enter into agreements relating to oil production. The immediate matter in hand, still in its preliminary stage, relates to negotiations with the Greek government on the possibility of a joint drilling venture in partnership with the National Bank of Greece.

India—New Dehli press source reports the Indian government has requested foreign oil companies refining in the country to examine the suitability of Soviet crude, which might be made available at prices 10% under crude presently imported from the Persian Gulf.

Iraq—Foster Wheeler Ltd., has received a £500,000 contract from Iraqi Petroleum Co. to design, supply, and construct a 250,000 b/d crude-oil sweetening plant at Kirkuk. This will be similar to the 11 plants of smaller capacity which FW has already erected on the same location. All design work will be done in the UK, which will supply substantially all materials and equipment.

Iran—A 20-in. 87-mile pipeline to Teheran from NIOC's Sarajeh oil and gas discovery will be Iran's first natural-gas line. It will be built, along with a 62-mile distribution network in Teheran, by Snam Progetti, one of Italy's State-owned ENI companies.

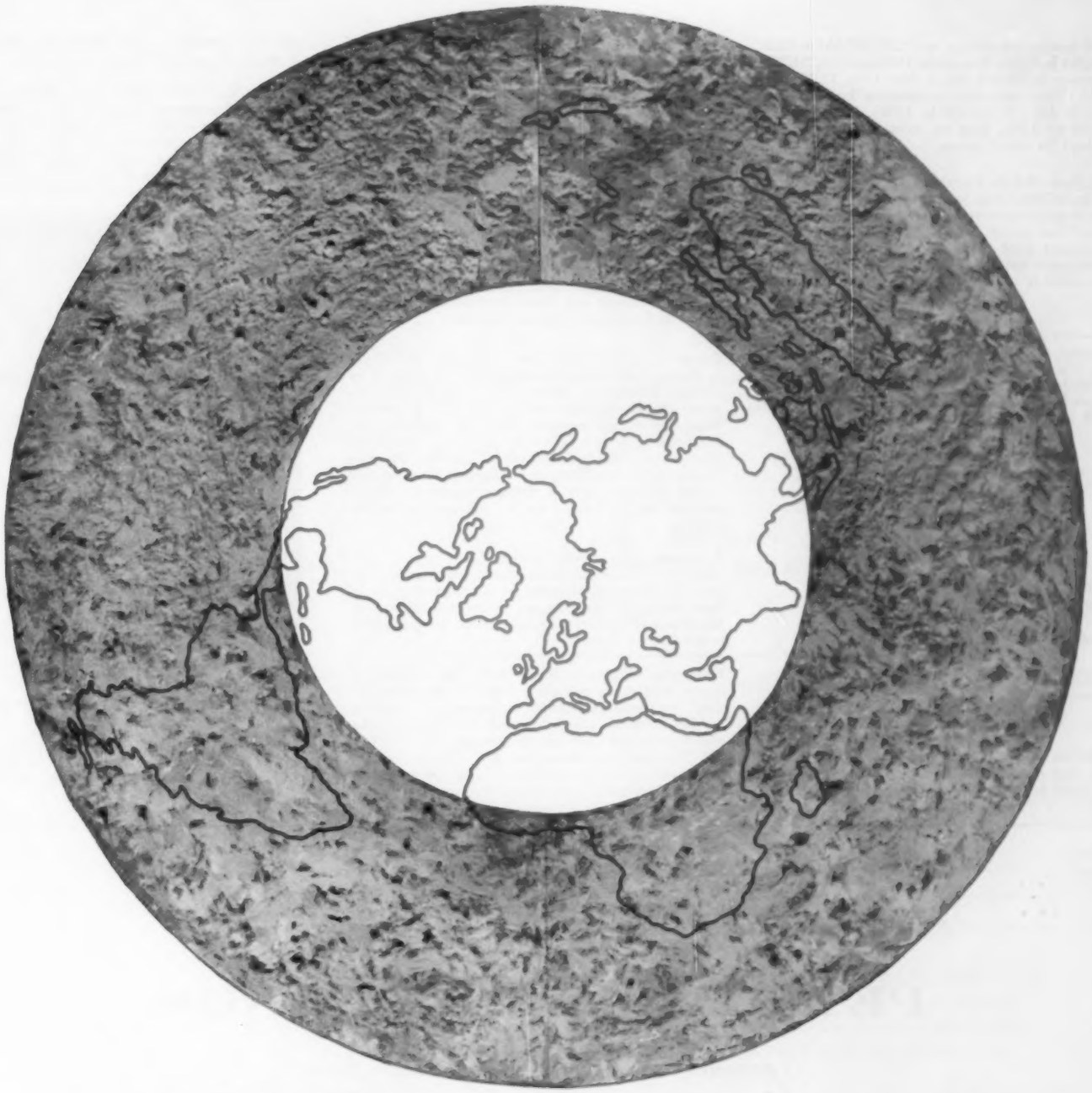
Iran—Iran Oil Refining Co. representatives have reached agreement in principle with Universal Oil Products Co. in Chicago for design, engineering, and process details of the new catalytic reformer which is to be erected at Abadan and to go onstream in 1962.

Ireland—A new Irish company—Shannon Estuary Co.—has a £30 million ($84 million) plant to establish an industrial area including a deep-water transhipment port at the mouth of the River Shannon. The first stage envisaged is the construction of a 1½-mile jetty costing £12 million, giving access to water 60 ft deep and connected with the southern shore of the estuary by a 1,100-ft causeway. The jetty would be capable of taking ships up to 150,000 tons. A large £2½ million drydock also forms part of the scheme. Oil transhipment is one of the primary aims of this project, and it is reported several oil companies are understood to be interested. The scheme is now before the Eire government for consideration.

Japan—Japan expects to begin shipping crude from its Persian Gulf concessions by next fall. A tentative contract for producing and shipping facilities has already been let by the Japanese-owned Arabian Oil Co.

Libya—B1-59, Oasis Oil Co.'s new Libyan discovery in Cyrenaica (see *WPR* 3-15-60), produced 810 b/d of 33 API gravity oil along with 143 b/d of water, according to The Libyan Petroleum Commission. First Oasis discovery in the concession, the well encountered oil in perforated intervals between 3,258 ft and 3,270 ft. Oasis F4-32 in Tripolitania struck oil and was producing 700 b/d of 40-gravity oil—marking the seventh successful well in this concession for Oasis from 17 completions. The productive wells have tested a combined capacity of 12,650 b/d. The largest, discovered last December, produced 8,000 b/d.

Mexico—Pemex reports 441 wells were drilled during 1959—298 producers, 143 dry. Total included 133 exploratory (42 producers, 91 dry) and 308 development wells (256 producers, 52 dry). Crude and distillate production during 1959 was 96,393,041 bbl (about 26,447 b/d), against 93,533,446 in 1958.



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Italy	by Capamianto SpA
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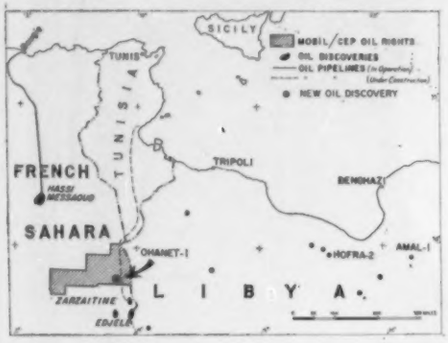
TA3612

Natural-gasoline production was 9,365,432 bbl in 1959 (7,107,959 in 1958). Exports in 1959 were 13,294,235 and imports 8,237,393 bbl, a drop from 13,400,000 in 1958. Total apparent consumption in 1959 was 97,991,151 bbl (96,424,642 in 1958), for a gain of 1,566,509 or 1.6%. Rigs on location number 32—with about 50 seismic crews.

Middle East—British Petroleum Co. reports its payments to Middle East governments in 1959 under the 50-50 agreements again were far in excess of the company's net profits, as in 1958. BP's Mideast payments totaled $322 million in 1959—almost double the company's net income of $177.4 million. BP's main sources of crude are Kuwait, Iran, Iraq, and Qatar.

New Guinea—After disappointing results since 1935, a company affiliated with Shell-Standard Vacuum-Caltex has stopped its extensive exploration in Netherlands New Guinea, and will confine its activities to production in established fields. Output in 1959 declined to 4,500 b/d from 5,000 b/d in 1958.



North Africa—CEP, French affiliate of Mobil International (Socony Mobil subsidiary), has announced the discovery of Chanet 1, approximately 350 miles from the Mediterranean near the Libyan border of the French Sahara and 30 miles from a crude pipeline linking the Edjeleh, Zarzaitine, and Tiguentouring fields with the Mediterranean. On drill-stem test, the well flowed 1,900 b/d of light-gravity oil, through a 1-in. opening, at a depth of about 7,740 ft. Chanet 1 is Mobil's third oil find in North Africa.

Pakistan—The government has authorized a survey of a proposed extension to the Sui-Multan gas-transmission line northward so as to provide gas to homes and industries in northern West Pakistan.

Panama—A meeting of stockholders in London has approved Ultramar Co.'s proposed purchase of Panama Refining and Petrochemical Co. by giving assent to the necessary capital increase.

Papua—To provide water for drilling Iehi well No. 1 in Papua, Australasian Petroleum Co. has adopted an unusual method for laying a 2½-mile pipeline between the Kikoti River and the rig site—a difficult terrain of jungle covered, pinnacled and creviced limestone. The line is being laid in approximately ½-mile sections between helicopter clearings, the pipe lengths being landed at one helicopter clearing and hauled through with a hawser attachment by a powered winch located at an adjacent helicopter clearing.

Venezuela—The newly formed State agency, the Venezuelan Petroleum Corp., is expected to begin its first well within six months on its 330,000 acres in Lake Maracaibo, according to Venezuelan Minister of Mines and Hydrocarbons Perez Alfonso. Initial capital is about US $750,000.

Venezuela—What may prove to be Gulf Oil Corp.'s largest field discovered since Kuwait is indicated by three "extremely productive" and widely spaced wells in the southern Ceuta area of Venezuela's Lake Maracaibo—with net pay thicknesses "up to 1,100 ft." This has been announced as one of two major discoveries by Gulf's subsidiary, Mene Grande. The second is in the La Ceiba area of northern Anzoategui, where two wells were completed each with some 700 ft of net oil and gas sands.

West Africa—Ste. des Petroles du Senegal (50% BP) has started a new stratigraphic test in Senegal, West Africa. Known as Nord Casamance No. 1, it is located south of the Gambian frontier, about 40 miles from Zinguinchor. Besides seismic surveys already under way, British Petroleum is associated in plans to drill a further series of "strats" in Senegal and Gambia.

Eight F-100 Super Sabres of the 354th Tactical Fighter Wing refuel at a new portable "gas station" under service test by the Tactical Air Command of the U. S. Air Force. During a special demonstration, nine aircraft were landed, refueled and ready for flight in less than 30 minutes. Developed by Goodyear Tire & Rubber Co., and Bowser, Inc., the air transportable system can fuel six aircraft simultaneously.

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The second anniversary of this vigorous oil program finds Argentina transformed from a major importer of crude oil and products to a nation within measurable distance of achieving its stated objective of becoming a net exporter of petroleum.

This dramatic change in Argentina's oil position is an indication of the success which has been achieved by the Government and YPF in their "battle for oil."

PAN AMERICAN PETROLEUM CORPORATION, through Pan American International Oil Corporation and Pan American Argentina Oil Company, is gratified to be represented among the companies working with YPF in its oil development program, and shares their confidence in the rapid accomplishment of their objective. Success in this new effort foretells continuing progress for the Argentine nation in the years ahead.

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MODEL 19-W for medium depth wells, compare this production chart on the 19-W with similar competitive makes.

Cyl. ID	Drop Pipe Size	Gals. Per Hour	1/3 H. P. Motor		½ H. P. Motor	
			20-40 Press.	Open Disc.	20-40 Press	Open Disc.
1⅜"	1½"	150	330'	420'	480'	510'
1⅞"	2"	280	135'	225'	250'	340'
2⅜"	2½"	450	50'	140'	120'	210'
2⅞"	3"	665		95'	55'	145'

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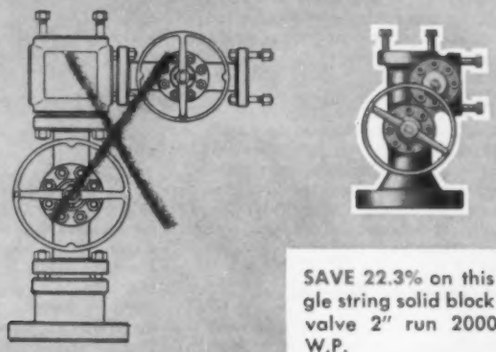
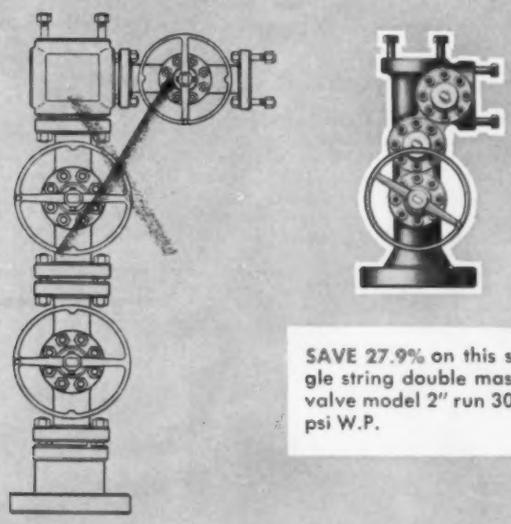


SAVE 22.3% on this single string solid block tree valve 2" run 2000 psi W.P.

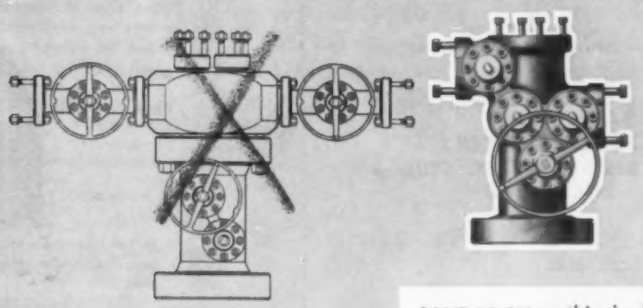
SOLID SAVINGS



SAVE 27.9% on this single string double master valve model 2" run 3000 psi W.P.

CAMERON Solid Block Tree Valves – the master valve and wing valve combinations, are producing an average saving of 21% over old style assembled trees.

This Cameron advancement eliminates most connections to bring you a safer, stronger and less costly completion – multiple or single, high pressure or low – all are equipped with regular API flanges to fit any wellhead.



SAVE 10.8% on this dual string solid block tree valve 2" run 3000 psi W.P.

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P. O. Box 1212 – Houston, Texas

Export Office: 7912 Empire State Bldg., New York City. In England: Cameron Iron Works Ltd., 76 Grosvenor St., London W. 1 England.

T. M. Hogan

L. R. Hill

J&L Appoints Hogan

Jones & Laughlin Steel Corp.'s export sales office in New York has a new manager, Mr. Thomas M. Hogan, a J&L employee for almost 24 years. Mr. Hogan succeeds Park B. Turner, who is retiring after 22 years of service. He has been manager of J&L's export sales since 1942.

Derrick Lighting

An 8-page publication designed to assist an operator in the selection of derrick lighting systems and components has been published by the Hutchison Manufacturing Co., manufacturer of Flolight vapor-tight derrick lighting systems, 6609 Avenue U, P. O. Box 9335, Houston 11, Texas.

World Tanker Construction

Lloyd's Register of shipbuilding returns show 249 tankers (100 tons gross and upwards) totalling 4,652,160 tons under construction throughout the world on March 31, 1960. This represents 49.7% of all tonnage building and a drop of 218,709 tons over the quarter. The leading tanker-building countries on March 31 were: Great Britain and Northern Ireland, 990,226 tons; Italy, 470,670 tons; Sweden, 461,714 tons; Netherlands, 419,463 tons; United States, 404,564 tons; Western Germany, 403,051 tons; and Japan, 396,360 tons.

Kellogg Appointment

The M. W. Kellogg Co. has appointed Mr. Luther R. Hill assistant to the vice president of sales. Mr. Hill worked with Kellogg for 23 years and more recently has been a private consultant and the process coordinator for The Arthur G. McKee & Co. Mr. Hill's new sales duties will be primarily concerned with the transition of research and development process results to commercial industrial applications.

Herb J. Hawthorne, Inc.

The appointment of B. F. Dugger as manufacturer's representative for Herb J. Hawthorne, Inc., Houston, has been announced by W. A. Davidson, sales manager for the exploration bit manufacturing firm. Associated with Seismograph Service Corp., Tulsa, for 15 years before joining Hawthorne, Mr. Dugger will work out of Midland, Texas.

New Instrument by Sinclair

Central Scientific Co., Chicago, has been licensed to manufacture and sell a new instrument developed by Sinclair Research Laboratories, Inc. Called the Sinclair-Cenco Gravitometer, it can be used to blend crude oil products or a variety of other liquids to a constant outgoing gravity. It is especially designed to direct liquids of differing gravity into specific pipe lines or storage facilities, to continuously measure the gravity of a liquid flowing through a pipeline for the purpose of quality control and to obtain a permanent gravity record. The instrument records the gravity corrected to 60 degrees regardless of the temperature of the flowing liquid.

Fluid Loss Control Additive

FLAC, a new organic fluid-loss control additive for cement has been announced by Dowell Division of The Dow Chemical Co. The new additive is said to be inert and does not react with the cement, increase the slurry viscosity, change the slurry thickening time, does not retard the setting of low temperature cements or lower the set strength of cement adversely.

B. F. Dugger

M. H. Grove

Grove Named to Top Walworth Post

The Walworth Co. has named Marvin H. Grove, president of Grove Valve and Regulator Co., to the newly created post of chief executive officer and has also elected him chairman of its executive committee. Mr. Grove's appointment was announced following a directors meeting in New York where election to the Walworth Board of John W. Collins, an officer of Grove Valve and Regulator Co., was also revealed.

Chemical Tubing Cutter

A bulletin on the Chemical Tubing Cutter has been published by the McCullough Tool Co. Copies of this bulletin (#801) are available on request by writing the McCullough Tool Co., 5820 South Alameda Street, Los Angeles 58, Calif.

"Triton" to Drill in the North Sea

Shell International Petroleum's new £500,000 drilling platform, the "TRITON," built to Royal Dutch/Shell specifications by Clelands Shipbuilding Co. at Wallsend-on-Tyne and illustrated in World Petroleum February 1960, is to operate in the North Sea next year. NV Nederlandse Aardolie Mij will drill three wells off the south Holland coast at sites depending on the results of deep seismic work still in progress. NAM's latest direct current diesel-electric rig will be used.

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This 3000 hp., 1485 r.p.m., 3kV motor is the largest direct-on power-line started machine to be installed in a British oil refinery; it is a Type AMS, pipe-ventilated, squirrel-cage induction motor and drives the main air compressor on the Hydroformer unit at the Esso Oil Refinery, Fawley. A similar rated machine, but force-ventilated because of the hazard, drives a hydrogen compressor on the same unit.

AEI motors are in use in oil refineries throughout the world, complete ranges of such motors have been designed by AEI Engineers to meet the specialized requirements of the oil industry. These motors embody the experience gained over many years and incorporate features which are essential to the oil industry.

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50,000 B/D Venezuelan Plant

A $30 million oil refinery at El Palito, Venezuela, has been placed in operation by an affiliate of Mobil International Oil Co. Located on the Caribbean coast near Puerto Cabello, the new facility has a capacity of 50,000 b/d. It processes crude from Barinas province, southwestern Venezuela, to which it is linked by a 210-mile pipeline. The refinery is designed to manufacture three grades of gasoline, kerosine, jet fuel, diesel oils, and heavy fuel oils. Some of the automotive fuels are sold through Mobil Oil Co. de Venezuela's rapidly expanding service-station network within Venezuela. A $2,500,000 lubricant-blending plant, also at El Palito, is capable of supplying 100,000 bbl of lubricants annually for the Venezuelan market.

Approximately 210 Venezuelans and 40 Americans are employed at the refinery and blending plant. Most of the Americans are in Venezuela on two-year contracts, and will train their Venezuelan replacements in this period. The company expects to operate the refinery almost entirely with Venezuelan personnel within a few years.

Elsewhere in South America, Mobil International affiliates have just completed a 55,000-bbl-per-year lubricant-blending plant at El Callao, Peru; will soon complete a 125,000-bbl blending plant at Viña del Mar, Chile; and within the next several months will begin construction of a 75,000-bbl blending plant in Colombia.

Mobil International is the Socony Mobil Oil Co. Inc. division which operates outside the USA and Canada.

Stripper Well Survey

The "National Stripper Well Survey as of Jan. 1, 1959" has been completed by the Interstate Oil Compact Commission, the Independent Petroleum Association of America, and the National Stripper Well Association. The Survey reveals that the 373,870 stripper wells in the USA produce 511,135 barrels of oil for an average of 3.75 b/d per well. They represent 65% of all wells and in 1958 produced 21% of the nation's total. It is estimated that approximately 11% of the USA reserves are in stripper fields.

Wins AAPG Award

Harold W. Owens, district geologist for the Humble Oil and Refining Co. at Tallahassee, Florida, is winner of the George C. Matson award of the American Association of Petroleum Geologists. The award was in recognition of his paper entitled "Florida-Bahama Platform" at the annual meeting of the association.

Acquires Delhi-Taylor Lands

Texas Gulf Sulphur Co. will acquire and commercially develop Delhi-Taylor Oil Corp.'s Utah potash properties. Texas Gulf has until January 1, 1961, to complete examination of the "technical aspects" of the project. "It is assumed commercial developments will begin upon completion of this work," according to joint-company statements.

Snodgrass in London

C. Stribling Snodgrass of Snodgrass Associates, Washington, D. C., oil consulting engineer, has transferred his headquarters to 65 Grosvenor St., London, W.1. He continues as consulting engineer—specializing in the processing, transportation, and utilization of oil and gas.

Prior to World War II, Mr. Snodgrass was managing director of Snodgrass, Perrin & Co. Ltd., a technical advisory organization in London. Recently, Snodgrass Associates completed studies on the utilization of gas from the Nahorkatiya field in northeastern Assam and on extension of the Sui gas pipeline system into the northern areas of West Pakistan.

Requests Import Review

The Independent Petroleum Assn. of America has asked President Eisenhower for a "complete review and re-evaluation of the level of oil imports under the government's mandatory oil-import program." IPAA seeks to have imports of crude and products (except residual fuel oil) cut back in the eastern two-thirds of the country—with imports from Canada (now exempt) to be deducted from the total allowable imports under the program.

Causes Profit Decline

As a reason for its appeal to the federal imports board for a 10,000 b/d residual-fuel import quota, the Middle East oil producer and refiner American Independent Oil Co. cited that its net operating profit in fiscal 1959 declined to 34.3¢ per bbl from 61¢ the previous year.

Golden Eagle Sold

Golden Eagle Refining Co., a Pacific Coast independent oil refiner and marketer, has been taken over 100% by Ultramar, fourth in size among British oil companies. Ultramar's operations are world-wide.

Golden Eagle, with its headquarters in Los Angeles and its refinery in Torrance, California, markets in six Pacific Coast States. As a result of its absorption by Ultramar, which has extensive oil production in Venezuela and Western Canada and the United States southwest, the group is now an integrated oil operation.

The same personnel who have been directing Golden Eagle will hold the identical portfolios under Ultramar ownership of the Company? Ultramar recently announced in London that it has formed a Canadian company known as the Golden Eagle Refining Co. of Canada, Ltd., which will build a new refinery at St. John's, Newfoundland and market in Eastern Canada.

NIOC New York Office

A branch office of the National Iranian Oil (NIOC) has been opened at the Time and Life Building in New York City. Mr. Abbas Ghaffari has been appointed manager. The National Iranian Oil Co. intends to increase its commercial relations with American firms and to develop possibilities of technical consultations with American experts.

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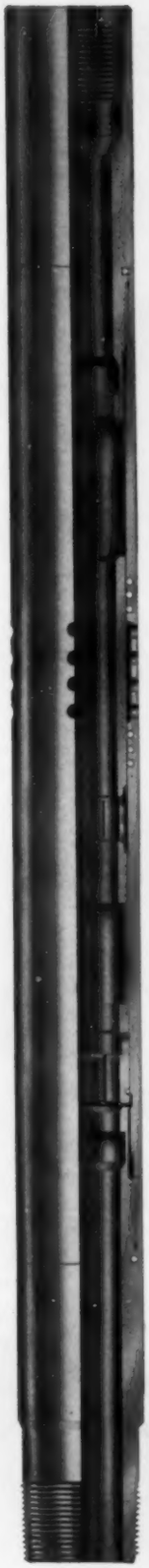

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GARRETT COLLET-TYPE SLEEVE WITH FULL CIRCULATING CAPACITY

Designed for optimum service, Garrett circulating valves combine maximum dependability with ease of operation. Check these important features:

- Positive sealing under all well conditions
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- High test pressures, with minimum O.D. and maximum I.D.
- Positive sleeve locating
- Repeatable shifting force, which remains constant under all well conditions
- No equalizing position

Wireline operated, Garrett circulating valves allow communication to be established or shut off in a tubing string. The proven Garrett internal sliding sleeve design is more dependable because the sleeve travels in a one-piece body. All sealing is on one plane, eliminating the possibility of pressure lock or pressure shifting. As a further safety feature all screwed joints have triple seals with tapered threads that insure positive locking.

Garrett circulating valves are available in 1¼", 1½", 2" and 2½" sizes and in all popular thread connections.

Check with your nearby Garrett field engineer for complete information and applications (he has information on those critical diameter parallel string dual completions, too). Call today.

USI Garrett Oil Tools

Division of U. S. Industries, Inc. P. O. Box 2427 Longview, Texas

Shell's refinery and terminal at Curacao.

Curacao Operations Closely Watched

Shell Curacao Ltd., formerly known as Curacao Petroleum Industry Co. Ltd., is continuing to streamline its operations in Curacao due to "the changing world petroleum situation." Shell operates a refinery which has a capacity of 210,000 bbls per day in Curacao.

In addition to the installation of improved mechanization systems in the refinery operations, the company is winding up its connections with many of its investment companies.

An example is the transfer of the formerly wholly owned Curacao Dock Co. Inc. Ltd. to a group which includes Pletterij-Nederhorst Combination Inc. Ltd. of Willemstad; Dock and Warf Co. Wilson-Fijencord Inc., Ltd. in Schiedam; and Netherlands Dock and Shipbuilding Co. of Amsterdam. Thus Shell-Curacao is out of the petroleum shipping and dock business here. Financial arrangements involved in the transfer have not been made public.

The streamlining of its operations to accomplish increased efficiency has resulted in the reduced need for personnel, causing a serious unemployment situation on the island. Some 1,200 employees were laid off last year as a result of new automation methods and the decrease in the numbers of employees continues this year.

Company officials are watching the current nationalistic situation in Venezuela closely. They feel that there may be a move by the present Venezuelan government to force foreign oil companies operating there to refine their crude only in that country and to export only finished products. Admittedly, they state, should such a situation arise, it would be a serious blow to Shell in Curacao as well as to Standard's vast refining operations on the nearby island of Aruba.

New Argentina Agent for Garrett

Garrett Oil Tools, division of U. S. Industries, Inc., has appointed Bolland & Cia S.R.L., Suipacha 238—7 Piso, Buenos Aires, Argentina, to represent the firm in the sale of all Garrett equipment, including gas lift equipment, sleeve equipment, relief valves, motor valves, safomatic valves, lease control system, and drilling equipment.

Pay and Politics

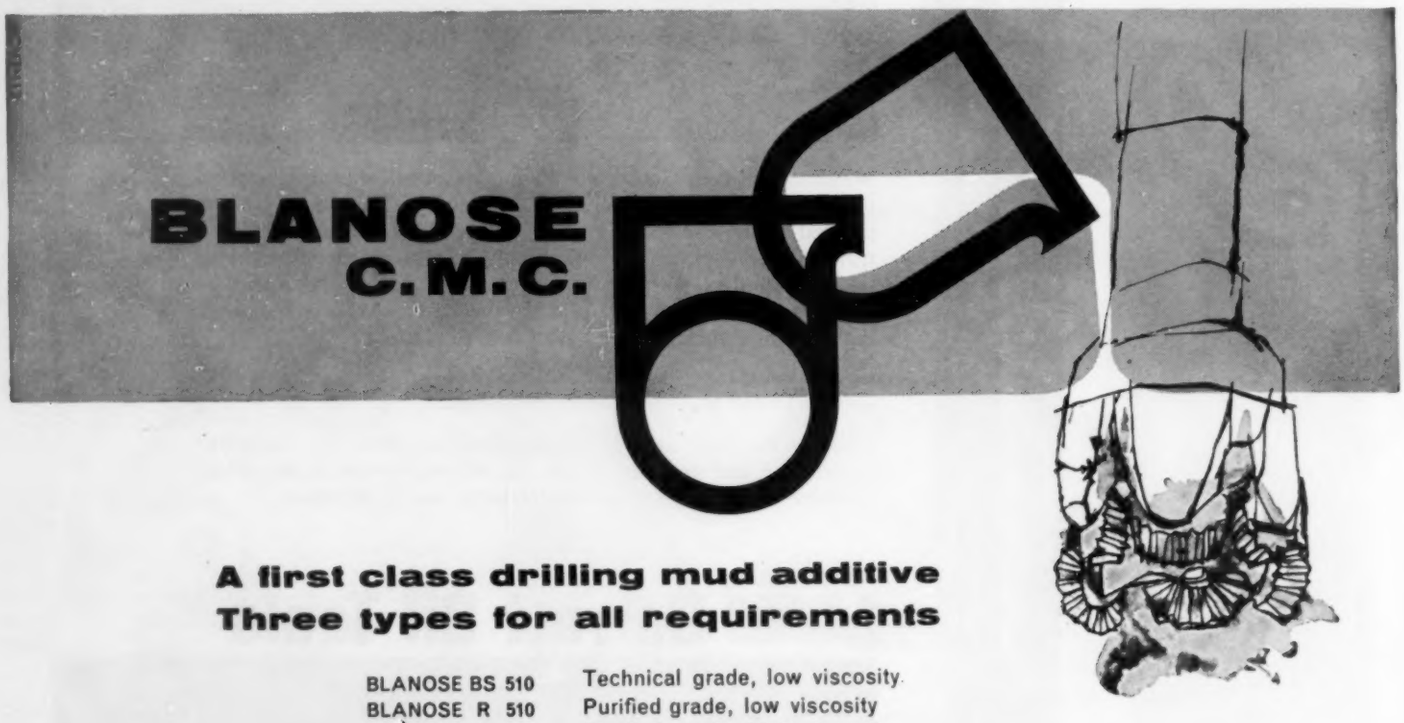
Continental Oil Co. will grant employes time off from work without loss of pay to participate in political party activities, according to L. F. McCollum, president. Continental is believed to be the first company in American industry to announce an official and written policy of this type.

The new Conoco policy applies to employes who have been elected and are serving as officers at the precinct level and above in the Democratic or Republican parties. It also applies to employes who have been elected and desire to serve as delegates to any regular political convention of either party. Time off not exceeding three days will be given a Conoco employe to attend a convention to which he is an elected delegate, said Mr. McCollum. Time off will also be granted an employe who is a party officer for the purpose of conducting election day activities.

Unit Petrochemical Project

El Paso Natural Gas Co. and Rexall Drug & Chemical Co. have announced four-year $75 million joint venture in the production and marketing of petrochemicals—including plants at Odessa, Texas, for the production of olefins, polyolefins, and chemicals.

First plants to be built are scheduled for early 1962 production of ethylene, propylene, conventional polyethylene, and linear polyethylene and polypropylene. Initial capacity of the olefin plants will be in excess of 200 million pounds annually, and of the combined polyolefin plants in excess of 150 million. El Paso will furnish the raw materials.



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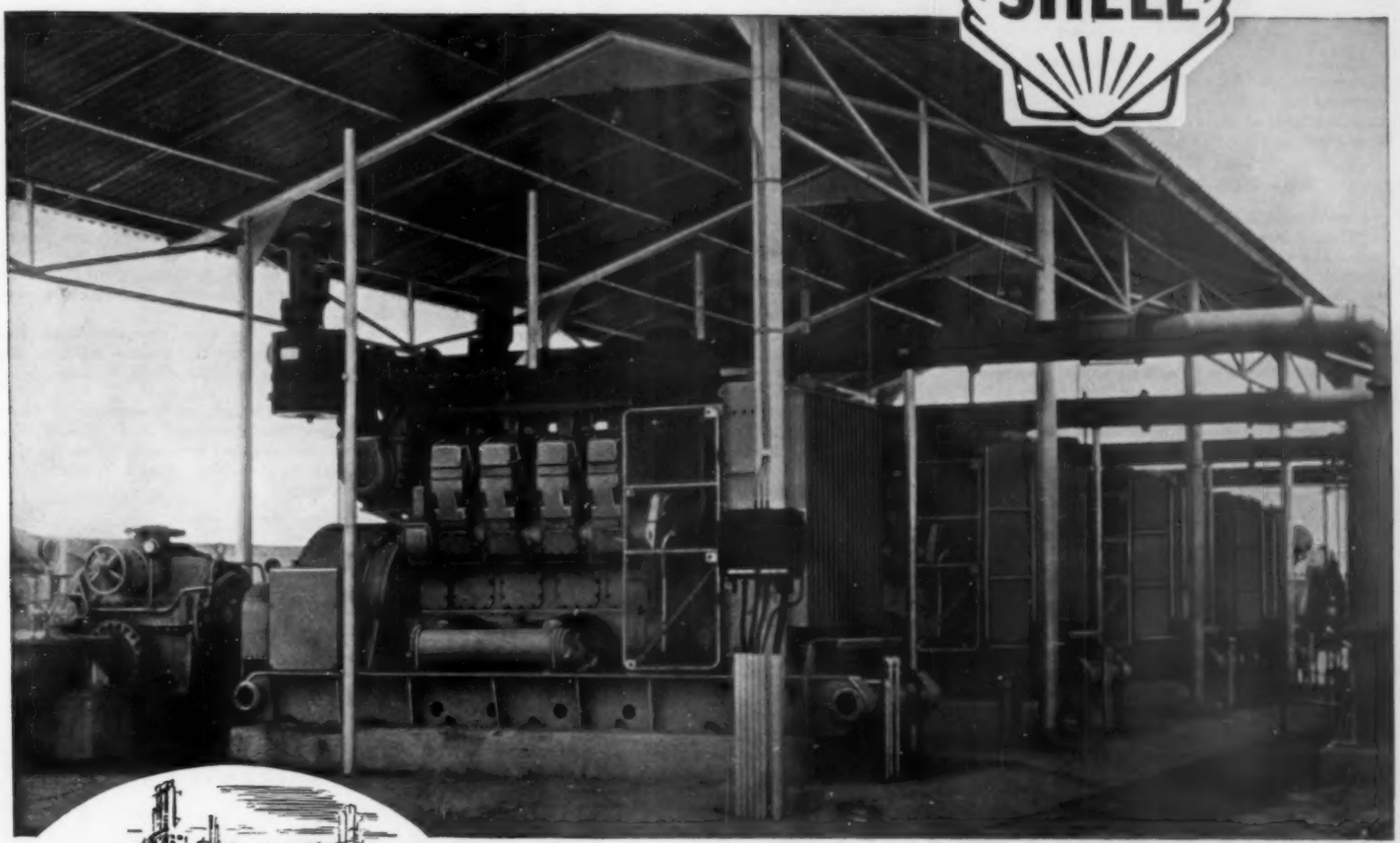

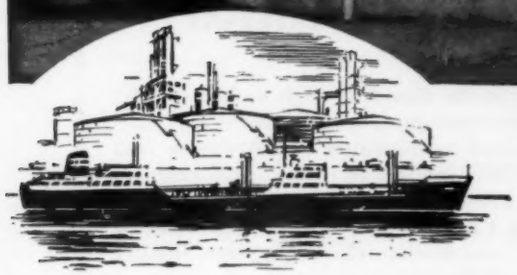

Four 'ENGLISH ELECTRIC' 8SV diesel engine package sets are on duty at the Puerto Miranda loading terminal of Cia. Shell de Venezuela Ltd. These sets, each with a continuous site output of 655 b.h.p. at 720 r.p.m., drive positive displacement pumps through hydraulic couplings to deliver the crude oil to tankers. The speed of the pumps can be varied between 290 and 720 r.p.m.

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Corrosion Inhibitors

Tretolite Co. has published a brochure on KONTOL Corrosion Inhibitors for producers. The booklet explains the application methods of KONTOL Corrosion Inhibitors to oil- and gas-well systems. Schematic drawings, graphs and photographs are used throughout the brochure to describe the product and its applications. Write to Tretolite Co. division of Petrolite Corp., 369 Marshall Avenue, St. Louis 19, Mo., or to Tretolite Co. of Calif., 5515 Telegraph Road, Los Angeles 22, Calif.

Clark Bros. West Coast Appointments

Clark Bros. Co., one of the Dresser Industries has announced the appointment of James H. Bews as manager of its San Francisco branch office. He formerly was sales engineer at Los Angeles where he has been succeeded by Hugh R. Lafferty.

Baash-Ross Promotion

Charles D. Crickmer has been promoted to chief engineer of the Baash-Ross division of Joy Manufacturing Co. He was formerly assistant chief engineer in charge of engineering activities at the Baash-Ross plant in Houston.

Knock-Down Housing Units

Elder Trailer & Bory, Inc., Denver, Colo, has added a "Knock-Down" model to its line of mobile housing units. The complete structure "knocks-down" into a compact unit, making it possible to reduce shipping costs by as much as 80%.

Schlumberger Promotions

Charles F. Gallagher has been named manager of the North Louisiana division for Schlumberger Well Surveying Corp. at Shreveport. A number of other transfers and promotions include the following:

D. D. Fitzgerald has been transferred to Houston as a sales engineer. H. C. Robinson has been reassigned to Beaumont and promoted to location manager. G. M. Lehnertz, sales engineer at Tyler has been promoted to senior sales engineer. J. A. Gilreath has been transferred to the South Louisiana division at New Orleans.

F. D. Whitman has been promoted to sales engineer at Wharton, Texas and C. G. Griffin, has been transferred to Columbia, Miss. and promoted to location manager. L. V. Turner, Mt. Carmel, Illinois, has been promoted to sales engineer.

Conservation Award

The Conservation Service Award of the Department of Interior was presented recently for "noteworthy contribution to the cause of conservation" to P. C. Spencer, chairman of the Sinclair Oil Corp. In making the presentation, Fred A. Seaton, Secretary of Interior, commended Sinclair's "consistent, effective effort to interpret and popularize the methods and achievements of conservation."

Marine Seismic Operations

A booklet describing facilities for conducting single-ship marine seismic operations has been published by Geophysical Service Inc., a Texas Instruments company. The new bulletin describes GSI's 405-ton Motor Vessel Sonic and the Texin, a 420-ton vessel recently purchased by GSI. Write for Bulletin S60-1, Geophysical Service Inc., c/o Marketing Department, 900 Exchange Bank Building, Dallas 35, Texas.

Gas Lift Seminars

To introduce its Opti-Flow technique Garrett Oil Tools is conducting a series of seminars in various cities and an advance school for senior staff engineers at Garrett's Longview, Texas. The new technique involves the use of a mathematical formula to select optimum conditions in the operation of gas lift wells. Curves have been developed through the use of computers to select the pressure and depth at which gas should be injected, best tubing size for the particular well and other factors. Remarkable savings in capital and operating costs have been attained by applying the technique according to Garrett engineers.

Rowley Heads Parkersburg Aetna

Craig M. Rowley has been elected president of Parkersburg-Aetna Corp. following the elevation of Bernard P. McDonough to chairman. Mr. McDonough continues as the chief executive officer. Mr. Rowley formerly was a vice president of the corporation and president of The Parkersburg Rig & Reel Co. division.

Argentines Visit Kerr-McGee

A six-member Argentine congressional group was the recent guest of Kerr-McGee Oil Industries, Inc., in Oklahoma City. The group, composed of four Senators and two members of the Chamber of Deputies, was escorted by two representatives of the U. S. Department of State. A tour of Oklahoma City and nearby ranches was conducted by representatives of Kerr-McGee. The group visited the Kerr-McGee Building, and saw a film of Kerr-McGee's offshore operations, after which Dean A. McGee, president of the company, explained the various activities of Kerr-McGee Oil Industries, Inc., which include extensive operations in Argentina.

Stewart & Stevenson Promotions

Joe Manning, formerly vice president and general manager, has been named executive vice president of Stewart & Stevenson Services, Inc., Houston. Charles Ward, who had been acting as assistant general manager, has assumed the position of general manager.

Dick Conolly, formerly South Texas district manager with headquarters in Corpus Christi, has been named coordinator of branches. His office will remain in Corpus Christi.

Tom Langham has been promoted from credit manager to assistant to the general manager. Dick Anderson, formerly with the C. I. T. Corp., is now credit manager.

N. N. Elkins, formerly sales manager at Corpus Christi is now branch manager. L. D. Howell, Houston service manager, has been assigned to the petroleum industry sales division. Harold Vaughan is now service manager.

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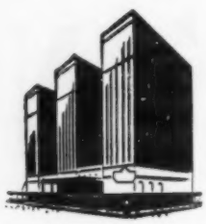

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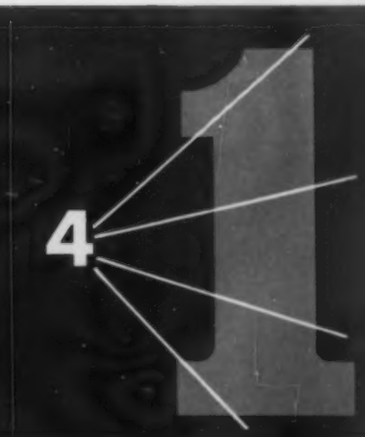

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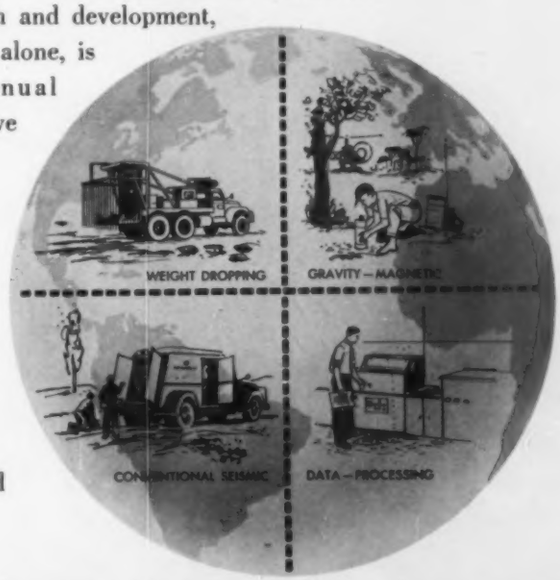

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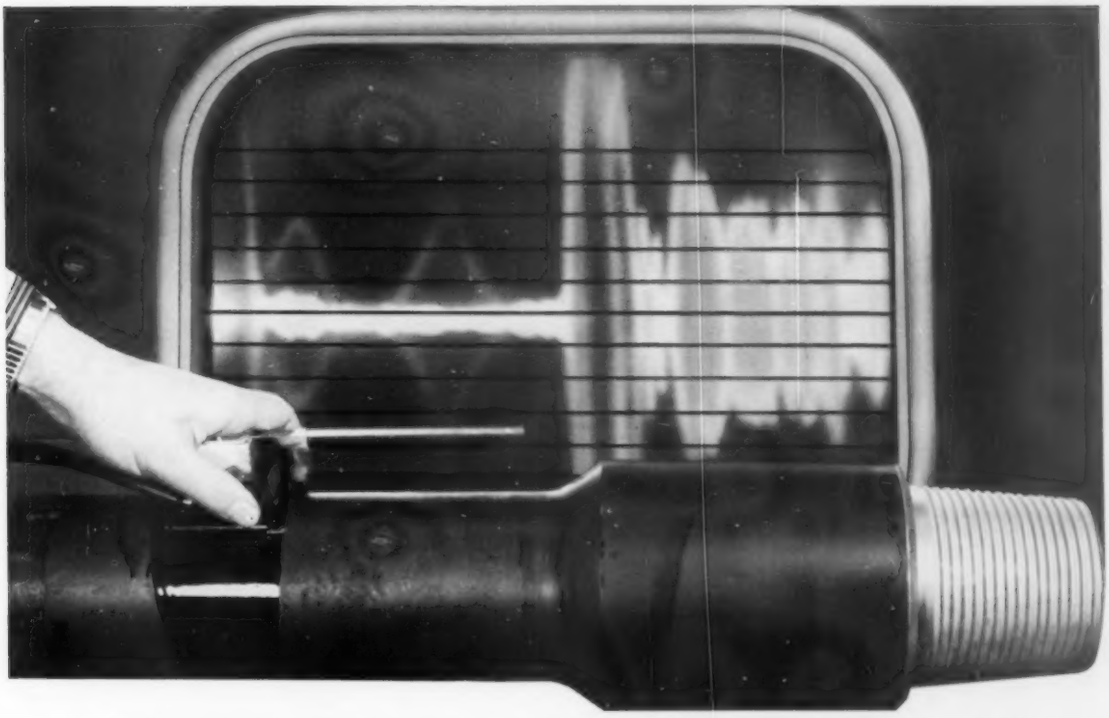

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